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POPULAR BOATING

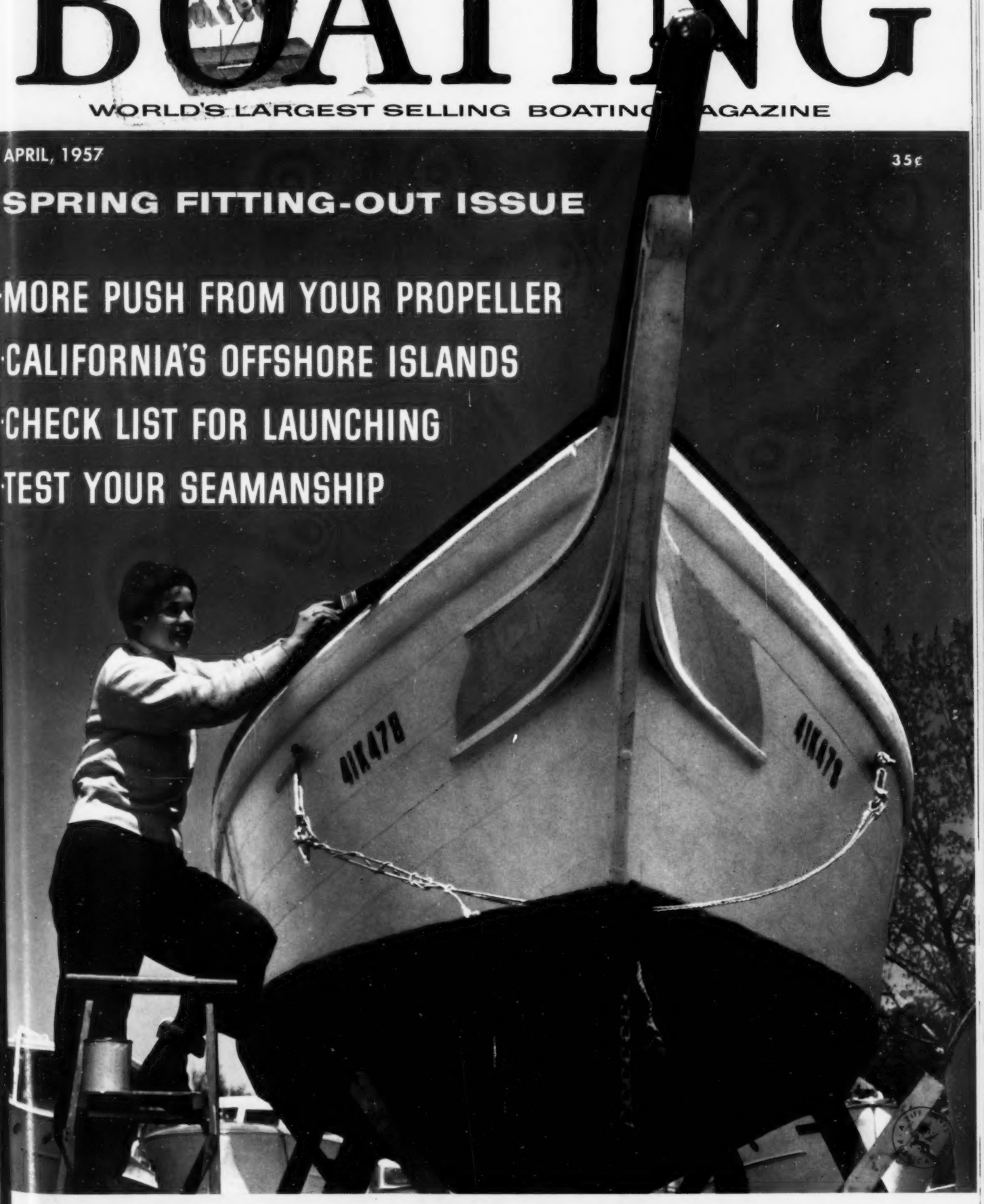
WORLD'S LARGEST SELLING BOATING MAGAZINE

APRIL, 1957

35¢

SPRING FITTING-OUT ISSUE

- MORE PUSH FROM YOUR PROPELLER
- CALIFORNIA'S OFFSHORE ISLANDS
- CHECK LIST FOR LAUNCHING
- TEST YOUR SEAMANSHIP



BUILD AN 11-FOOT OUTBOARD

Getting there is twice the fun, with two Sea-Horses aft

FOR MEN OF ACTION, MOTORS TO MATCH...

"Sweetest-running Johnsons ever!"

Not all aids to navigation flash or clang. Nine new ones thrum, ever so quietly. They're the 1957 Sea-Horses. You can't touch them for dependability. Or for go under load, with five now delivering 18 or 35 hp. They're easier than ever to hand-start and now three have 12-volt electric starting. A new slip-clutch ends drive pin worries and as an accessory for the two top models, there's even a new quick-charging generator. See your Johnson dealer now. He's listed under "Outboard Motors" in the Yellow Pages. **FREE!** 1957 Sea-Horse catalog, write: Johnson Motors, 192 Pershing Road, Waukegan, Ill.

(Division of Outboard Marine Corporation. In Canada: manufactured by Johnson Motors, Peterborough, Ont.)

A million Sea-Horse owners will tell you *JOHNSON KNOWS BEST*

FOR '57! A WIDE AND WONDERFUL CHOICE!

(From $155 to $625)

Golden Javelin*, Sea-Horse 35*, Sea-Horse 35, Sea-Horse 18*, Sea-Horse 18, Sea-Horse 10, Sea-Horse 7½, Sea-Horse 5½, Sea-Horse 3

**12-volt electric starting (new quick-charging 10-ampere generator with automatic voltage regulator available as accessory on first two models listed). Prices f.o.b. factory, subject to change . . . OBC certified brake hp at 4000 rpm (18s and 35s at 4500)*

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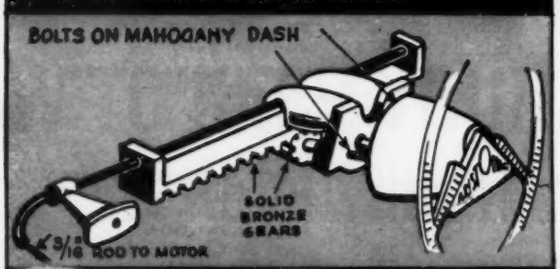
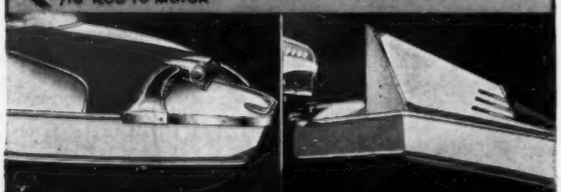
Photographed at Cypress Gardens

ONLY ARISTO-CRAFT HAS GEAR-STEER

Aristo-Craft, the pioneer, gives outboard fans a steering system once available only on expensive inboards at *no extra cost*. GEAR-STEER utilizes all-bronze gears and one steel rod encased in lubricant to eliminate hazardous, cumbersome rigging. There's no jerks or backlash. Steer relaxed at any speed with fingertip control.





EVERY PART AND ACCESSORY CUSTOM CRAFTED

Aristo-Craft presents a new kind of newness, possible only because Aristo-Craft designers fashion every part and accessory. There's not one "added on" ornamentation to mar the vibrantly alive silhouette. You get sculptured harmony with beauty integral with every line.

PICK OF PERFECTIONISTS

Los Barquedos—famed precision drill team of San Diego, California, choose stock Aristo-Crafts to execute the spectacular formations that have thrilled thousands. These perfectionists know split-second timing calls for a boat true, agile and easy to handle. Learn what top sportsmen and stock boat racers everywhere already know. See your

ARISTO-CRAFT

You Get HYDRA-FLIGHT ENGINEERING and the DYNAMIC GLAMOUR and GO of NEW

Speed-Sweep STYLING

Action personified . . . modern design at its sharpest and best. Aristo-Craft is in a class by itself with unequaled appeal for the young in heart who want the ultimate in vivid performance and head-turning eye appeal. No boats have ever earned so many headlines! You get dazzling beauty that causes boat-side clusters wherever they're docked. Hydra-flight engineering masters buoyancy, friction and gravity to give the LIFT of a lifetime to all who take the wheel. You get a long list of features that make Aristo-Craft the unquestioned leader. See it and no other boat will do for you. Aristo-Craft . . . the most spirit-lifting outboard of all time. But efficient mass production means you can own it for less than you'd pay for ordinary boats.

SEAFLASH "13"	$547
TORPEDO "14"	647
AVALON "15"	779

Prices above are for fully equipped boats, f.o.b., Atlanta

DEALERS — SELL THE LEADER!

America's most talked about outboards are first in demand in every city in the land. Mammoth expansion program means a limited number of dealers will be chosen now. Write or call now to see if you can qualify!

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OR WRITE
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POPULAR BOATING

A ZIFF-DAVIS PUBLICATION

APRIL 1957

VOLUME 2, NUMBER 4

THE MAGAZINE FOR ALL BOATMEN—POWER AND SAIL

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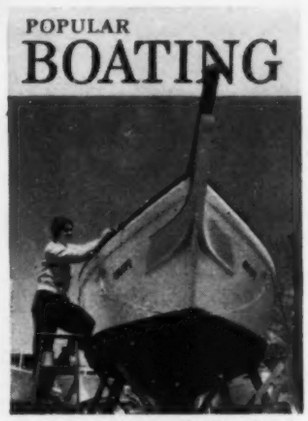

Frank A. Muth of Cleveland, Ohio, member of Freelance Photo Guild, caught this graceful old craft getting her new make-up.

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HOW TO KEEP YOUR ENGINE YOUNG LONGER!

... Refill with HAVOLINE every 50 hours

THE SMARTEST thing a boat-owner can do at this time of the year is to take a tip from America's leading boat and engine builders – get a complete oil change to Advanced Custom-Made Havoline Motor Oil.

Havoline does three things to keep your engine young longer:

1. An extra-heavy-duty oil that exceeds all marine motor oil requirements, Havoline gives your engine superior protection against wear and rust. It lubricates better.

2. It cleans as it lubricates—cuts down engine deposits. Fully detergent and dispersive, it prevents the building up of hard carbon. A cleaner engine gives you quicker starts, full power, economy of operation.

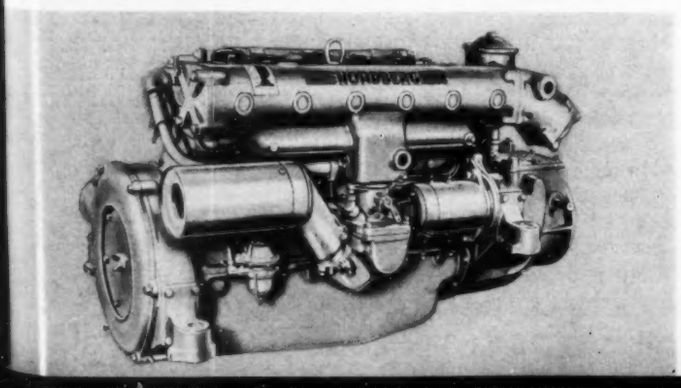
3. Havoline contains a special rust-inhibitor to keep engine parts shiny and clean – and to constantly fight *rust*, the great killer of marine engines. If you're a *really smart* boat-owner, you'll change oil *regularly* . . . every 50 hours!

With new equipment to help, making a complete change to Havoline Motor Oil is simpler than it used to be. Ask your Texaco Waterfront Dealer about it.

The Texas Company, *Marine Sales Division*, 135 East 42nd St., New York 17, N. Y.

Texaco Products distributed in Canada by McColl-Frontenac Oil Company, Limited.

THE NORDBERG® KNIGHT . . . The popular 155 HP Nordberg Knight engine is available in either direct or reduction drive. Also optional is hydraulic reverse. The Knight is built by Norsemen Marine of Oshkosh, Wisconsin. This leading manufacturer highly recommends Havoline Motor Oil.



PORT OF CALL. Every Texaco Waterfront Dealer – along the United States and Canadian coasts and throughout the inland waterways – carries Havoline. Steer for the Texaco Star. And that's where you'll find Sky Chief Marine gasoline, the *modern* marine engine fuel that gives you more power, reduces engine wear and protects against gum.

New and Nautical

Now, at the time of spring fitting out, every boatman is concerned with new products he can use to make the coming boating season better, safer, and more enjoyable. Here are presented a number of the more interesting and useful items.

—F. D.

OUTBOARD EQUIPMENT

THE vast and steady increase in outboard boating is being reflected in an unusual number of items intended for outboard use. Even manufacturers who never before showed interest in this aspect of boating are coming out with products for the outboarder. An example is the Columbian Bronze Corporation of Freeport, Long Island, which, after 50 years of specializing in inboard propellers, is now manufacturing propellers designed for outboard engines. This new line of customized props includes models intended for the varying conditions effecting boating efficiency—hull, horsepower, and load. Columbian engineers state that in most cases the original propeller can only approximate the design required for ideal performance; accordingly there is a need for customized propellers which are specifically adapted to such different uses as cruising, high speed operation, angling, trolling, water skiing, and other types of boating. They suggest that, after installing a Columbian custom propeller, the boat owner carry his original as a spare. For the convenience of outboard motor owners, they are also supplying marine dealers with a Prop Selector chart which shows how to select the proper propeller for the type of boat and motor used.

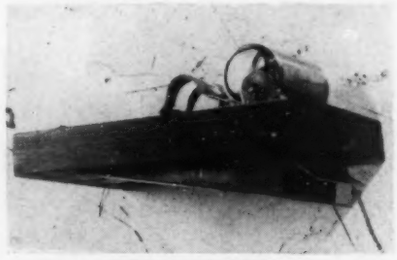
We find also a continuing stream of improvements in outboard motors themselves. Oliver Outboard Motors, a division of The Oliver Corporation, Chicago, Illinois, has announced a completely new ignition system for their 35 hp Olympus motor. Compact and versatile, this aircraft-type magneto-alternator system provides both AC and DC for all ignition requirements of the motor, and acts as a generator to provide energy for lights, horn, and other electrical accessories at all speeds through the motor's range of operation. Among advantages claimed for this system are increased spark plug life and improved resistance to heat and moisture. Heart of the system is a Bendix-Scintilla magneto with pivot-type breakers, tungsten contact points, and precision-molded cam followers. The 12 volt generator is rated for 6 amps at 4,500 rpm. The circuit provides high voltage only in short high-tension leads between transformer coil and plug and is claimed to provide maximum ease of starting with a minimum of electric stressing.

The Danielson Manufacturing Company, Danielson, Connecticut, has announced price reductions for their complete line of nylon-covered steel-centered tiller cables. Prices for Danlon (nylon-coated cable) are now 15c per foot for 5/32" diameter and 18c per foot for 3/16" diameter. New prices for Duracord (vinyl-coated cable) are 12c and 13c per foot for the same respective diameters. Nylon coating, according to the manufacturer, affords greater protection to the steel cable and assures longer cable life. The coating is applied to the steel by a process which forces nylon into the cable strands and wires. The result is said to be immune to cracking and peeling. Cable is available in red, blue, and natural.

The same company has developed a new oversize tiller cable, rated for loads up to 2,000 lbs., especially for motors over 20 hp. The manufacturer claims that this product, with an extra thick (13/64") nylon-coated and 1/8" preformed galvanized aircraft cable, offers twice the tensile strength of ordinary tiller cable. It is priced at 28c per foot. They are also offering an outboard safety cable at a lower price than heretofore. It is four feet long, made of 3/32" aircraft cable coated with duPont Nylon, and is designed to support weights up to 900 lbs., strong enough to support the average outboard motor. On one end of the cable is a 4" loop; on the other, a heavy cast manganese bronze snap. It lists at $1.75.

BAILERS

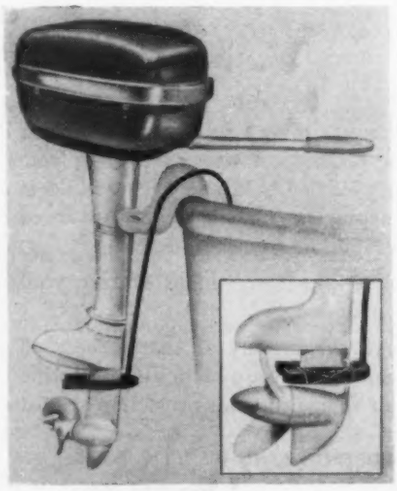
One of the more intriguing accessories we have come across is the Bello Bailer, designed and manufactured by Duarte Bello of Estoril, Portugal, and distributed here by Hard Sails, Inc., 204 Main Street, Islip, New York. It is made entirely of stainless steel and works on the Venturi principle. When the scoop section is lowered below the hull the water flowing by creates an area of decreased pressure immediately abaft the opening which causes the inside water to be sucked out. The cam action handle, which is manually operated, closes the bailer when not in use, compressing it tightly against a rubber gasket. Then the bailer is perfectly flush with the bottom of the boat. The aft opening is also protected by a flap valve which will close automatically when the boat goes below speed necessary for operation. The bailer has a larger opening (9/16" x 2 1/8") for draining than the standard types and yet is designed to minimize



BELLO BAILER

drag when open because of the small angle the scoop makes with the bottom of the boat. This also minimizes the possibility of catching weeds or debris, or of damaging the bailer, as it will close if contact is made. This device is expressly designed for the lower speeds of sail boats. The speed necessary for operation varies with the displacement of the hull, so that a smaller sailboat such as a dinghy could bail at a lower speed than a larger one such as a Star. It is priced at $14.50 f.o.b. Islip, New York.

Another new bailer is the Vacu Jet, sold by Scott-Mitchell House, Inc., 611 Broadway, New York 12, N. Y. It can be hooked on to any size outboard



VACU JET

motor, except the 3 hp, just below the cavitation plate. When the motor is started, the suction created draws water from the boat at the rate, the manufacturer says, of three to five gallons per minute. This bailer is made of plastic and vinyl tubing and weighs 10 ounces. It is priced at $3.95, postpaid.

NEW BOATS

The latest addition to the line of fiberglas boats produced by Fiber

SUDBURY'S

Sensational

Guaranteed Bottom Paint

The Only Non-Fouling Paint with a WRITTEN GUARANTEE

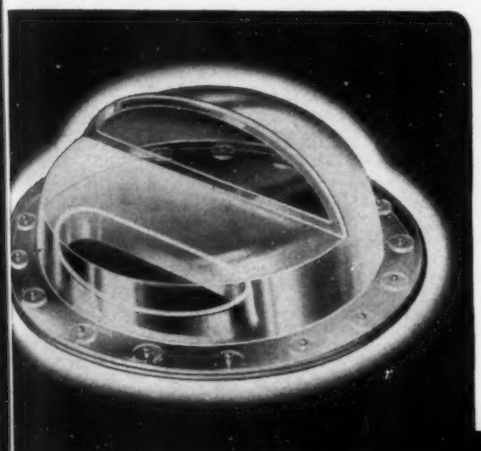
MOST ECONOMICAL because it LASTS ALL SEASON!

STOPS ALL MARINE GROWTH

After years of research and testing, Sudbury gives you guaranteed protection against bottom fouling—saves expense too because it eliminates costly mid-season haulout! Sudbury "365" stays smooth, clean and guards against troublesome bottom growth from spring launching to fall lay-up. Means care-free, maintenance-free cruising all season.

In comparative tests with "365", other leading bottom paints showed severe fouling within 30 days...were heavily encrusted with grass, barnacles, etc. the third month...while Sudbury "365" was 90% effective at the end of 18 months, is guaranteed for a full 365 days!

"365" Bottom Paint has excellent coverage—about 350 sq. ft. per gal. Easy and quick to apply; just remove loose particles of old paint, sand lightly and brush on "365" as it comes from the can. The only old finish that must be removed is vinyl. Written guarantee on every can for full replacement of paint at no charge if any marine growth occurs within one year. Most economical paint for continuous protection. Qt. $9.95 Gal. $35.90



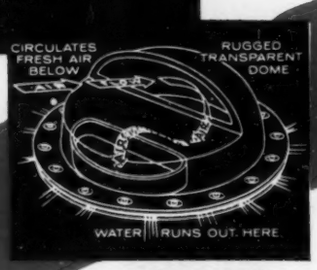
SKY-VENT Circulates Air, Keeps Out Rain, Spray

Admits Fresh Air & Light Even with Hatches Closed

Enjoy positive Three-Way-Comfort below decks. Sudbury's Sky-Vent insures full circulation of air, clear lifetime plastic admits light and sun...keeps out all rain and spray. Good ventilation is pleasant for you, better for the life of your boat and your equipment. Whether your boat is moored, at anchor or driving into a head sea, Sky-Vent is on the job 24 hours a day to keep below decks fresh and dry. Eliminates sweating, condensation, dry rot and mildew. Smooth, streamline dome top...can't foul lines or trip guests. No metal—no maintenance—nothing to polish. Non-magnetic.

9-in. diameter $34.95; 12-in. $59.95; 18-in. $89.95

Ingenious Design—Circulates Fresh Air Admits Light Keeps Out Rain, Spray



MORE LEADING SUDBURY PRODUCTS

AQUA-CLEAR Feeder

Protects Engines from Rust, Corrosion, Salting Down

Makes all water entering the cooling system completely non-corrosive. Forms an invisible microscopic water-tight film on all metal parts. Improves heat transfer and stops salting down. Ends danger of internal rust...can double the life of any marine engine. 1-piece welded clear lucite construction makes water circulation always visible.

Marine engines don't wear out—they rust out! Aqua-Clear Feeder cools direct with raw sea water, without rust! Protects all cylinder heads, manifolds, water jackets, etc. No moving parts, no maintenance. Easy to install. Over 35,000 in use.

Model	Engine Size	Cost
A	20 to 74 hp.	$36.50
B	75 to 145 hp.	$49.95
C	150 to 250 hp.	$89.95
D	over 250 hp.	$180.00

SUDBURY SUBMERSIBLE PUMP

Corrosion-proof, double-sealed in lifetime plastic. Motor 100% watertight, no flooding or electrolysis. Extra large plastic screen (nearly 60 sq. in.) seldom needs cleaning. Direct drive. No belts, gears. Easy to install. Wt. 3 lbs. Only 4½ in. wide, 5½ in. high. Pumps 200 gals. per hr. with 2 ft. lift; will lift as high as 6 ft.

6 Volt Model, only $34.95
12V $36.50; 32V $38.75

If Dealer Cannot Supply—ORDER DIRECT

SUDBURY LABORATORY, Box 41G, Sudbury, Mass.
Please send me the items listed below,
for which I enclose $.....

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Name.....

Street.....

City.....State.....

SUDBURY LABORATORY Box 41G, Sudbury, Mass.

Craft, 1820 N. E. 146 Street, North Miami, Florida, is this 17½ foot duo-colored outboard cruiser. It has been in the working stages for the past two years. It has a 75″ beam, a 38″ freeboard and weighs about 550 lbs. We are told that it can take two long shaft

FIBER CRAFT CRUISER

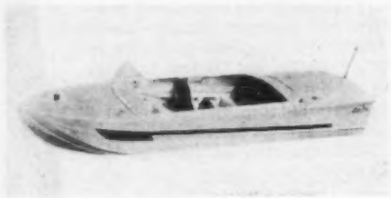
motors and that it is maneuverable enough to turn in its own wake. Like all of the other boats in the Fiber Craft fleet, it is guaranteed for one year not to break, split, peel or chip.

Other new outboards on the market include the 1957 additions to the Valco line of all-aluminum boats, made by

ROYAL 14

the Valley Aluminum Company of Fresno, California. The Royal 14 features a non-glare, color impregnated fiberglas deck. It has a walk-through center deck and carries large blocks of Styrofoam mounted under the seats for buoyancy. The larger 16 foot Vampire is designed to accommodate up to 30 hp motors and will carry up to six passengers. Aircraft-type riveted construction is used in all of its boats. The manufacturer is now gearing production for national distribution; formerly Valco boats were sold only in the West.

A new aluminum inboard is the Sports Run-About made by the Polar Kraft Manufacturing Company, 1237 North Watkins, Memphis, Tennessee.



SPORTS RUN-ABOUT

It is powered by the Fageol 44, a 35 hp motor, and is capable of a speed of about 35 mph. The length is 15′5″ with a 65″ beam. The depth amidship is 31″, and it weighs 600 lbs. It features a latex-coated bottom, to provide safe footing, and Styrofoam flotation.

In general, pleasure boating has become so popular and boat manufacturers so prolific that the public can choose now from almost an infinite number of boat models, including also an incredible number of the so-called novelty boats. The latest one of these that we have seen is the Power Skis manufactured by Marin-E-Products, 3030 Bridgeway, Sausalito, California.

POWER SKIS

This craft, which combines the skis and power source in one unit, will do 26 mph with a 10 hp outboard and 33 mph under 20 hp. It can itself tow another skiier, and in that case its speed would be reduced by three to five mph. The motor is operated by remote controls, and the whole contrivance is steered by leaning in the desired direction. Each ski banks individually, and the motor turns automatically, allowing sharp turns.

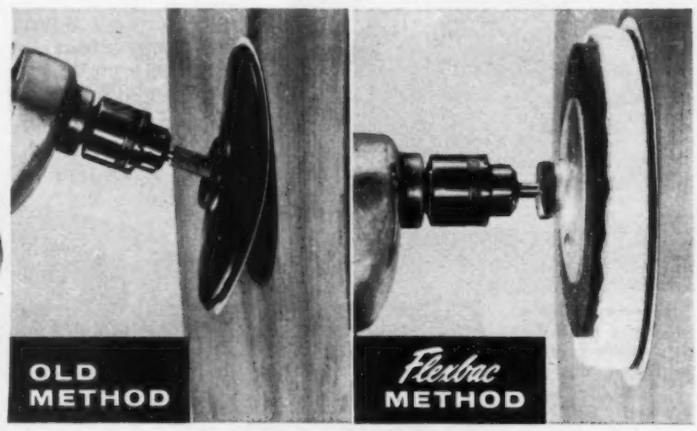
LIQUID PLASTICS

A new watertight Vinylon marine

(*continued on page* 56)

Never a swirl mark

with Fast *Flexbac* Finishes



With ordinary Disc Sander. Partial contact of disc to work surface creates pressure point—leaves swirl mark.

Full contact of disc to work surface—pressure absorbed, cushioned and evenly distributed—no swirl marks.

NOW YOU CAN GET fast professional finishes on hulls, masts, spars or decks with an electric drill motor and the FLEXBAC Pad. You can cut hand-sanding operations up to 95% with no sacrifice in finish quality. Carborundum's FLEXBAC Pad follows complex curves and contours without leaving swirl marks. The soft, flexible cushion-type pad eliminates pressure points because there's no center nut. Discs are held to pad by a pressure-sensitive adhesive... can be peeled off and replaced in seconds. Waterproof Paper Discs or "HANDY-SANDY" Discs come in a complete range of grit sizes for use with the FLEXBAC Pad to give you exacting finishes... on wood, metal or plastic.

Cushion-type resilient pad sands with smooth, even pressure on contour or flat surfaces without leaving swirl marks.

BOAT REFINISHING KIT. Contains complete 5½″ FLEXBAC Pad Assembly, adapter for electric drills, 5 assorted sanding discs plus can of adhesive restorer.

ONLY $7

AT YOUR BOATYARD OR MARINE HARDWARE DEALER. FLEXBAC Pad is also available in 8½″ diameter for just $7.95.

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by **CARBORUNDUM**
REGISTERED TRADE MARK

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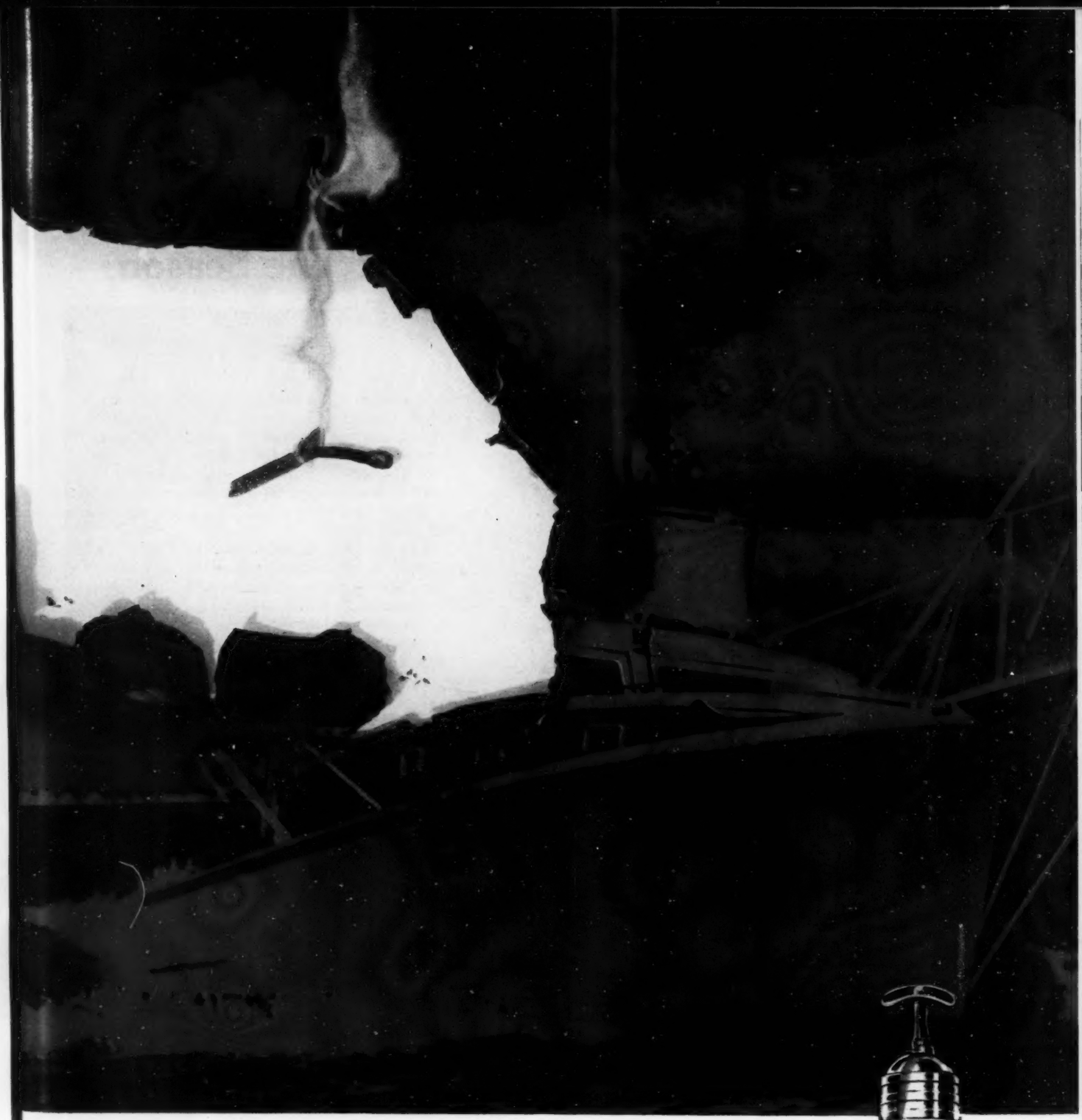

Underwriters' Laboratories and Factory Mutual Approved

Boating fires can be eliminated!

Thousands of American "boating" families enjoy cruising the waterways *safely*—guarded against fire by Pyrene-C-O-Two *safety-engineered* extinguishers!

Marine activities sometimes present hazards from all three classes of fire: (A) combustible solids, (B) flammable liquids, and (C) electrical. These hazards *can* be controlled, if your craft is protected by Pyrene-C-O-Two fire extinguishers or systems.

Call your local Pyrene-C-O-Two distributor today. He carries a complete line of quality extinguishers, systems, brass goods, hose and accessories. Or write to:

Pyrene C-O-TWO

PYRENE-C-O-TWO DIVISION

THE FYR-FYTER COMPANY

Dept. PB, Newark 1, New Jersey

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Fishing For All

How to

Start The Season

By LAWTON CARVER
POPULAR BOATING'S *fishing correspondent*

I REMEMBER it just as though it were last year, starting around 5 o'clock in the morning, which is when it was—

It was cold getting out of bed, and colder still getting to the bacon and eggs and coffee in the dining room separated by a couple of hundred feet from the bedroom cabin. It was so cold that ice clung to the trees as it sleeted down, and it didn't look at all like spring, although that is what it was technically and, more specifically, it was the opening of another trout season.

As we made our way to the stream there were no long pink fingers of dawn reaching across the skies, the way the outdoor writers put it. There were no birds happily twittering a greeting to a new day, and no green foliage to say the sap's a-rising and the outdoors call you.

There was only a drizzle of rain and sleet, when it got light enough to see through the murk that was destined not to let through the bright sun of day for another 48 hours. It was cold as a beaver's belly. When we weren't fishing we spent our time chipping ice from the guides of the rod. The thought occurred to me that this would be the last time I would arise at 5 o'clock in the morning on opening day in order to freeze and catch no fish, which had enough sense to get in out of the weather and stay there, under a rock.

There hadn't been much sleep the night before. We had gathered in the cocktail lounge of the lodge to talk fishing and tell old tales about past season openings, during which conversation I was mostly silent in the presence of my betters. Being a latter day convert to trout angling, with few opening days and no great deeds to boast about, I sat listening, while getting myself fortified against snakebite, not to be confused with frostbite for which there is no preventive, except staying in bed.

One fellow sat under a dim light tying leaders for the opening. Another dressed some flies, and everybody talked about the good old days. Nobody paid any heed at all to the cold drizzle outside. It was drowsily warm in the cocktail lounge of the Rainbow Lodge, on the Esopus, in the Catskills, and the main thing on the minds of these anglers was to get through the night and out into the weather in the morning.

The situation obviously called for live bait, but nobody in this group gave worms or minnows a thought. It would be flies or nothing. The trout would get themselves caught our way or miss this golden opportunity and not get caught at all.

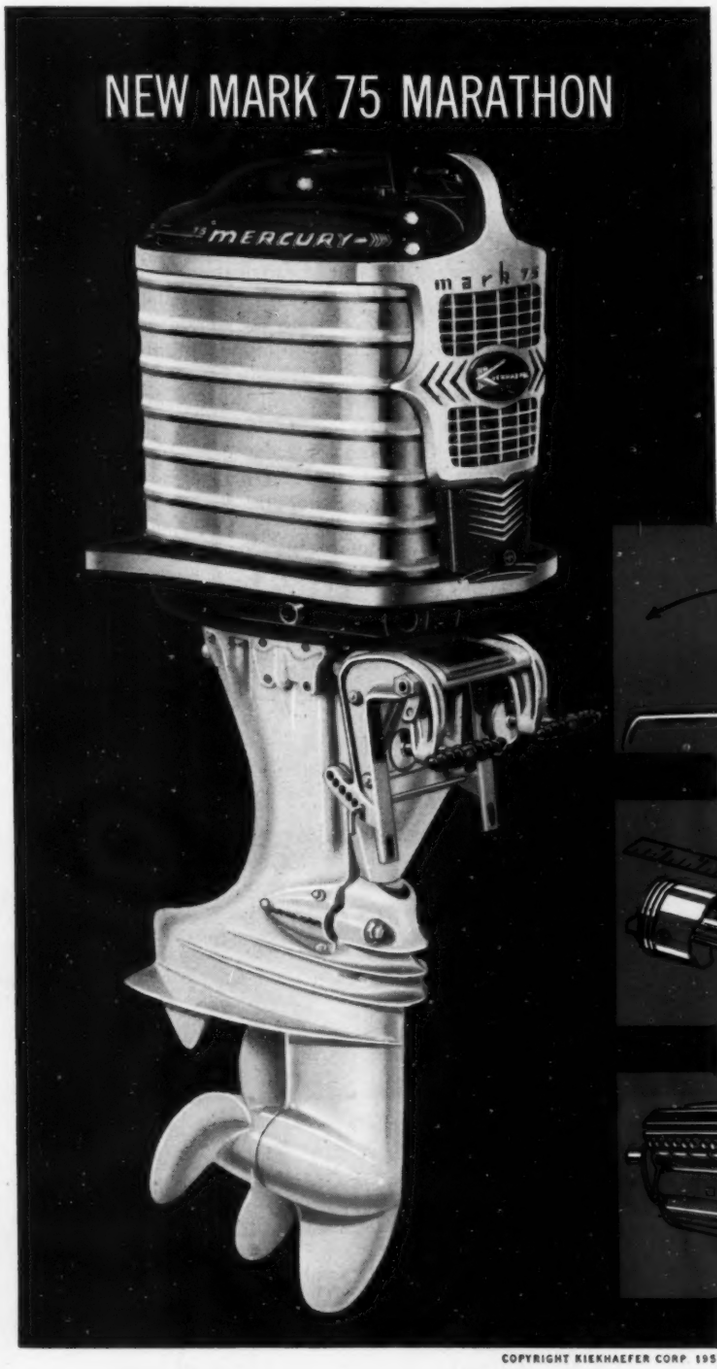
I had fished perhaps a couple of hours when I became convinced beyond all doubt that I'd never make another opening day, getting out of bed at 5 o'clock, to let a wet fly go drifting off downstream, while I stood there with the rod in the crook of an arm and hands under my parka, slowly freezing.

It was too cold to stand still, but also too cold to walk. I decided to walk anyhow and stepped upon what I thought was firm footing to make my way downstream. I broke through a thin crust of ice into haunch-deep brown red clay and was stuck fast after a moment of floundering. There was no point in shouting. The nearest fishermen were

(*continued on page* 77)

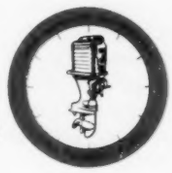
REVOLUTIONARY 60HP MERCURY

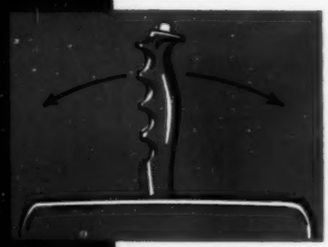
America's first 6 cylinder outboard!



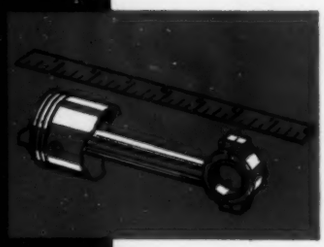
• Now in production! *Real* outboard power—safer, smoother, more maneuverable than any engine you've handled! Revolutionary 6-cylinder design . . . a firing impulse every 60 degrees . . . the smoothness and flexibility of the finest sports cars! Single lever control...*direct* reversing with no bulky gears! Super hot ignition for instant starting . . . smooth and slow idling!

Now as low as 10% down, up to 24 months to pay with Mercury's Time Payment Plan!

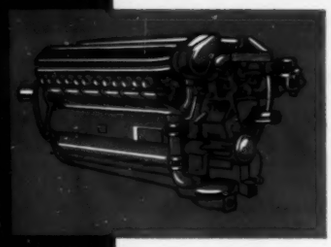




NEW SINGLE LEVER CONTROL. *Puts 60 h.p. in the palm of your hand! A touch on the thumb button starts the engine. Push lever forward for speed. Pull back for reverse. Easiest ever!*



16% LESS PISTON SPEED. *Slow-travelling, short-stroke pistons prolong engine life. Other engines, even at lower rpm, have up to 20% more piston speed than this built-to-last Mercury Mark 75 Marathon!*



EQUAL TO A V-12 IN SMOOTHNESS! *Naturally, a 6-cylinder 2-cycle engine has same number of firing impulses per revolution as a 12-cylinder, 4-cycle V-12! Mercury's famous Full Jeweled Power* guarantees smooth power longer, too!*

**Anti-friction ball and roller bearings throughout.*

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See them now at your Mercury dealer's!

» 6 to 60 HORSEPOWER

HERE'S HOW

Answers to your boating queries

By JOHN KINGDON

QUESTION AND ANSWER EDITOR

"CAN you tell me how to convert an automobile transmission to marine use? Since I work in a machine shop, I can make most anything."

J. A. V., Lebanon, Ore.

There's a U-drive boat-rental outfit near my home that powers each of its craft with an automobile engine which is equipped with an automobile-type clutch and transmission. This seems to work all right, but it is awkward and has the further disadvantage that the reverse gear is the same ratio as the lowest forward gear. In reverse, the engine screams at top speed while the propeller merely idles at a few hundred rpm's. This is a strain on both engine and transmission.

Either one of two things can be done. First, you can buy a regular marine reverse gear. With such a gear, one lever controls both declutching and shifting, and full engine power and speed can be used in reverse. Second, the automobile transmission can be converted by taking out the low and intermediate forward gears and replacing the reverse gear with a new one that will give top engine performance in reverse. For more information on the subject of transmissions and reverse gears, I suggest that you write to the Auto Engine Works, Inc., St. Paul 4, Minn., and to the Paragon Gear Works, Taunton, Mass.

A marine transmission alone, however, will not make a successful marine engine out of a car engine. Several other modifications should be made. A feature article will cover this at a future date.

Take the carburetor for instance. Since the engine is normally installed in the boat at a considerable angle, a wedge-shaped adaptor should be added to the carb's mounting flange to bring the carb back to a level operating position so the float can move up and down in the float bowl without jamming. And Federal laws require that a flame arrestor or backfire trap be mounted on the carb's air-intake nozzle.

The cooling system should also be modified. Since the simple centrifugal water pump on a car engine isn't big enough to lift water from a scoop intake on the bottom of the boat up to the top of the block, a more efficient water pump should be substituted. And since in a boat there is no cooling air flowing past the exhaust manifold, the manifold should be waterjacketed.

It isn't necessary for you to fabricate and machine these conversion parts. Why bother when complete conversion kits to fit nearly all car engines are readily available and quite inexpensive? Several companies manufacture such kits. Among them are:

Barr Marine Products Co., Philadelphia 34, Pa.
Federal Marine Motors Co., Chicago 19, Ill.
Lehman Mfg. Co., Newark 2, N. J.
Leon Marine Motors Co., Beverly, N. J.
Miller Marine Motors, Elizabeth, N. J.
Mohawk Marine Motors, Garfield, N. J.
Osco Motors Corp., Philadelphia 34, Pa.
Stokes Supply Co., Coldwater, Mich.

(*continued on page* 54)

Something Bold - Something New!

the great Thompson Sea-Lancer

Here she is—all 16 feet 7 inches of her from bow light to transom. The spanking new Thompson Sea-Lancer—a deep-water craft designed especially for single motors to 60 hp. She's a big boat all around—with 74" beam and 34" depth—but alert and nimble for easy handling in any water. Ideal for offshore fishing, water skiing, family cruising, general utility. A beauty, too, with the grace of a gull in every line from the smartly flared clipper bow to the extra wide transom.

Famous Thompson Safety-Lap construction—marine plywood planking lapped and brass-bolted from stem to stern, brass-screwed to stout ribs, and waterproof sealed. Strong. Tight. Solid.

Like her? Go see her at your Thompson dealer.

FREE CATALOG. Complete '57 line in full color, including 18' Offshore, 16' Sea-Coasters, 14' Sea-Skiffs and Lap-Chines. Write for your copy.

THOMPSON BROS. BOAT MFG. CO.
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374 Elm Street, Cortland, New York

Thompson BOATS

first—and finest—for family boating

these owners say: *Get an* INTERCEPTOR

125 H.P. 145 H.P. 165 H.P. 185 H.P. 215 H.P.

From Gastonia, N.C.: "She packs a lot of horsepower and will snap three and four skiers out of the water without the slightest hesitation."

From Greensburg, Pa.: "At cruising speed of about 1200-1500 r.p.m. it burns about three gallons per hour. The other boats on the Allegheny River just can't seem to figure this out—"

From Toledo, Ohio: "Even my wife likes the boat since I put the Interceptor in it. She says, 'We can do things with it now.' For the first time in five years I can carry four and six people—"

From Prince Frederick, Md.: "I am the happiest boat owner in the Chesapeake Bay area. I have licked every boat in the Patuxent River."

From Italy: "The motor is superior to any eulogy and an asset to the perfect boat."

From Seattle, Wash.: "Magnificent engine, amazing performance."

From Portland, Ore.: "—phenomenal—I call it my little panther because it runs so smooth and quiet. I get 1/3 more mileage than.....engine of another make."

From Dallas, Tex.: "It is the marine engine of tomorrow, here today. Beats the fastest runabouts—one had the advantage of an extra 105 h.p."

From Palm Beach, Fla.: "Uses so little gas it seems to run on its reputation."

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CHECK LIST *for Launching* —

Handy hints before hitting the water after a short haul-out or a long winter ashore

OUTBOARD

Examine hull for any exterior cracks or strained areas.

Check inside ribs to be sure none have split or show loose fastenings.

Look under wooden seats, into all cuddies and lockers made of wood, at the underside of all gunwales and decking where ventilation might have been bad and dry rot could get started. Cut out any damaged wood; treat any suspicious wood areas with preservative.

Count life preserver cushions or jackets to see if more than enough are available. Check vest fabric to see if it is aging; cushions to see if they are packing down and loosing buoyancy. See if they float easily or become waterlogged.

Examine all fittings, cleats, lights, chocks, rowlocks to be sure they are securely fastened down and are in good working order. If replacing on a wooden boat, use bedding compound underneath to prevent water seepage and rot.

If fire extinguisher is required, check to be sure it is fully filled and has not rusted. Replace worn lines.

Examine transom carefully where outboard is clamped and look for any cracks, fatigue, or loosening knees.

Recheck all control cables for signs of fraying or wear and replace if indicated. Lubricate pulleys and bearings.

Give outboard motor close inspection for cracks or rust spots and touch up with matching paint. Replace last season's spark plugs. Add recommended grease to lower unit.

If hull has drain plug or syphon bailer, be *sure* it is closed before putting boat in water.

INBOARD

If boat has been in wet storage or recently hauled after use, examine hull, underwater fittings and area around them for signs of grounding or terado damage. Check propeller blades for knicks, shaft for warping, struts, bearings, and rudder for wear or electrolysis.

Give special attention to thru-hull fittings, both inside and outside the hull when they are below the water line.

Determine if *working* seacock is in the line, or some method of plugging hole if the line should break while underway.

Examine marine toilet for possible freezing damage and determine if flexible valves need replacement.

Examine all fuel lines carefully for weak joints that might leak. Be sure legal flame arrestors and drip pans are in place on engine.

Look for signs of cracked block on engines stored in cold climates. See if freeze plugs have been popped. Examine all spark plugs and replace if at all indicated.

Go over topsides for signs of wear from off-season covering. Check all deck fittings, lights, ground tackle, lines, safety equipment, fire extinguishers, chafing gear.

Determine if topsides have been overpainted and should be taken back down to the wood. Examine fiberglas cabin and deck tops for delaminating from wood base, canvas for leaks or worn spots.

Be *sure* hull drain plug is in place before launching—every year people forget.

SAIL

Check and see if you haven't already missed some pleasant sailing weather and shouldn't plan to start earlier next year.

Hull condition will do much to determine your speed; plan for time to give your bottom at least one extra-fine sanding down and careful painting.

Re-examine sails and hose down if necessary. Give consideration to the new Dacron sails if a new suit is needed.

Switch end-for-end sheets and halyards that are still serviceable. At the same time examine all mooring and docking lines for condition. Twist rope against the lay to observe wear of the inner strands.

Give all rigging a critical examination for condition and lightness. If replacements are necessary, and class regulations permit, examine some of the new light fittings that may reduce weight and wind resistance aloft.

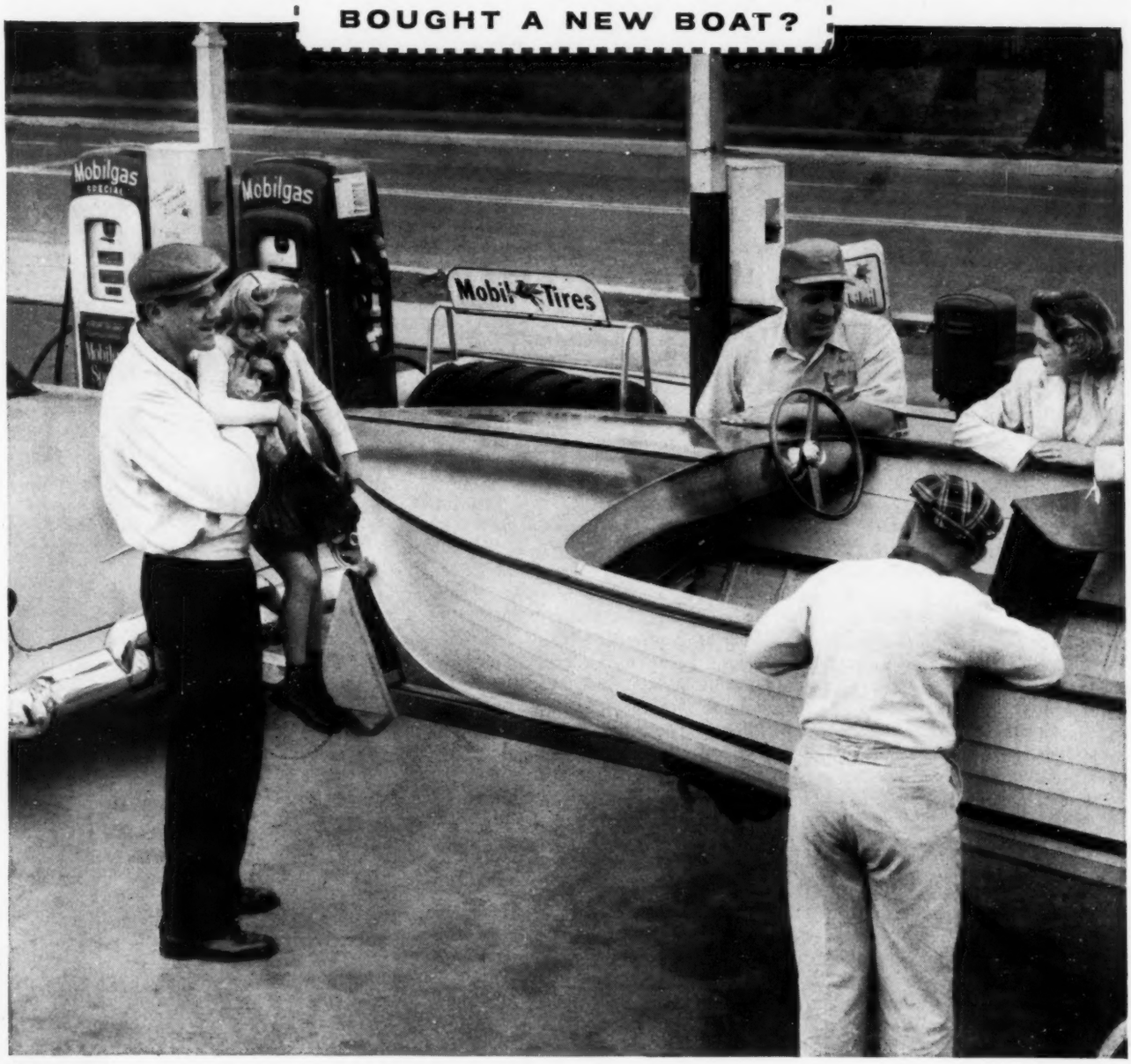
Worn spots on sails may show where a spreader has been boring into a slatting main. Serve with tape or marline any fittings that might snag a sail.

With a centerboard craft, be sure the trunk has not been slighted when anti-fouling bottom paint was applied. Drop or remove the board and spray or mop in with a long stick a good coating for this hidden area.

If craft will be launched with mast already stepped, do not set up standing rigging in wooden boat for taught tuning until she has been in the water several days.

Check to be sure bilge drain plug is in before launching, and have the laugh on someone else this year.

BOUGHT A NEW BOAT?



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FROM THE EDITOR—

WHILE birds and bees, blossoms and boatmen all over the country are busy getting ready for the new season, the Committee on Merchant Marine and Fisheries of the House of Representatives are completing their first step in the study of recreational boating safety in the United States. While skippers are fitting out for spring, Representative Bonner's committee is studying ways we can fit out our waterways with wise laws that, for many seasons ahead, can give us maximum safety with minimum restrictive legislation. The results already obtained by this conscientious committee are outstanding. For the first time, a direct and judicious look has been taken at the tremendous growth of our sport and the safety problems now involved. Boatmen have been brought face to face with the fact that family fun on the water is the concern of all of us if we are to keep it that way. Hearings held in all parts of the country have resulted in 1638 pages of testimony—the first comprehensive survey of public boating opinion ever compiled. Recommendations to the committee ranged from suggestions that we now need as many laws for the water as the highway, down to statements that any laws of any kind might get in a boatman's way, and that no action should be taken on any phase of boating safety.

Now the committee will restudy and evaluate the testimony to determine what action should be recommended to Congress. Already, as a result of the hearings, committee members have formed opinions of what may be needed. Recently Representative John J. Allen of California, speaking from his own observations in a very cogent statement of what the committee had observed, said in part: "The Committee has a very positive desire not to hamper or interfere with the enjoyment of the sport of boating. It does not want to enact any legislation which will be a burden upon anyone, either because of the size of his vessel or his investment, his age, or the nature of the opportunity he has to enjoy this family sport." In addition, Representative Bonner, Chairman of the Committee, has told POPULAR BOATING that due consideration of all phases of boatmen's problems are now being undertaken before final recommendations to Congress are made. Boatmen can be sure no hurried and unwarranted actions will be made.

It is now expected that the committee is likely to recommend a law requiring numbering of all motor-driven boats on Federal waters; the definition of reckless and negligent operation may be clarified; enforcement of laws against minor offenses should be made more workable.

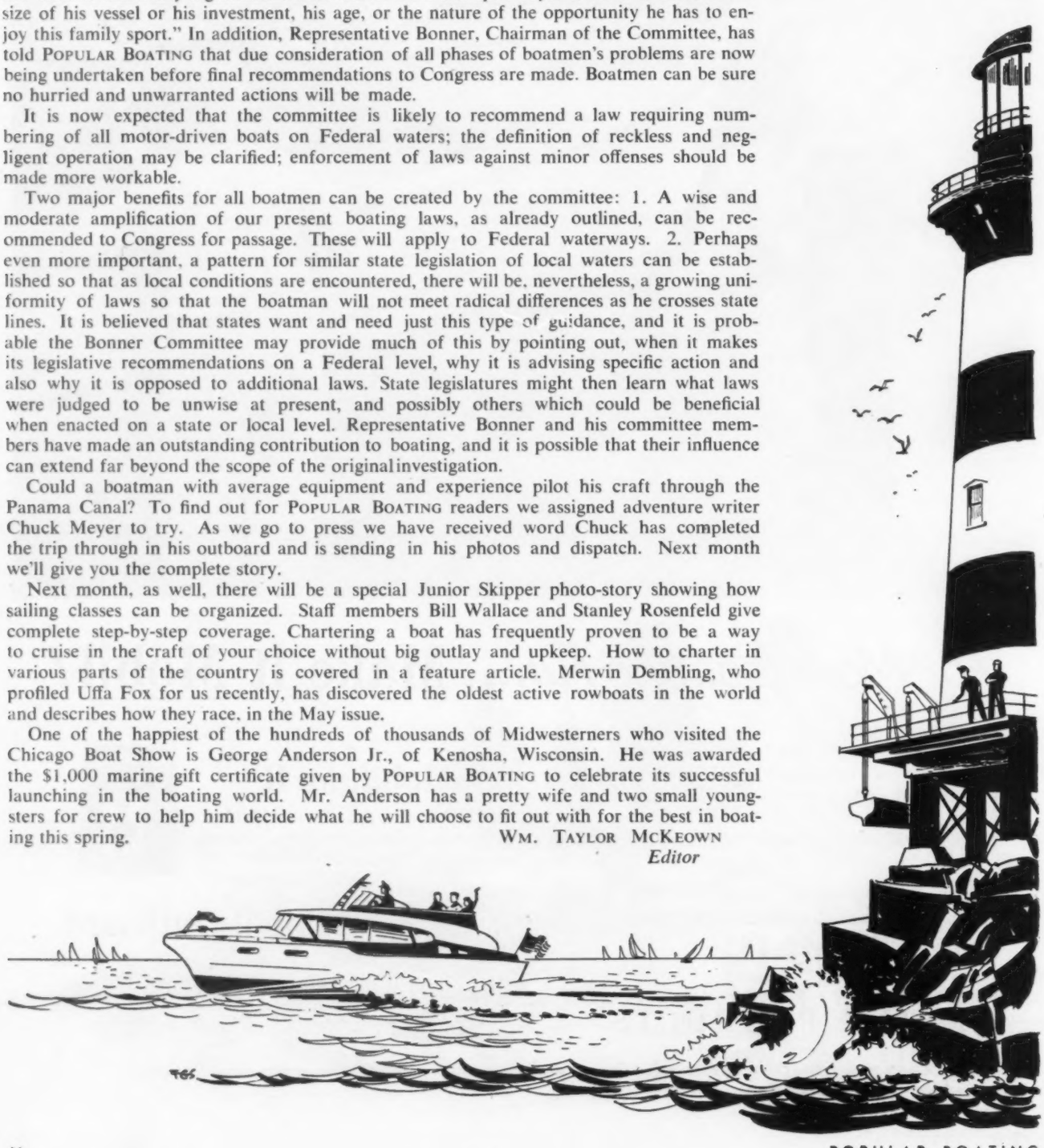
Two major benefits for all boatmen can be created by the committee: 1. A wise and moderate amplification of our present boating laws, as already outlined, can be recommended to Congress for passage. These will apply to Federal waterways. 2. Perhaps even more important, a pattern for similar state legislation of local waters can be established so that as local conditions are encountered, there will be, nevertheless, a growing uniformity of laws so that the boatman will not meet radical differences as he crosses state lines. It is believed that states want and need just this type of guidance, and it is probable the Bonner Committee may provide much of this by pointing out, when it makes its legislative recommendations on a Federal level, why it is advising specific action and also why it is opposed to additional laws. State legislatures might then learn what laws were judged to be unwise at present, and possibly others which could be beneficial when enacted on a state or local level. Representative Bonner and his committee members have made an outstanding contribution to boating, and it is possible that their influence can extend far beyond the scope of the original investigation.

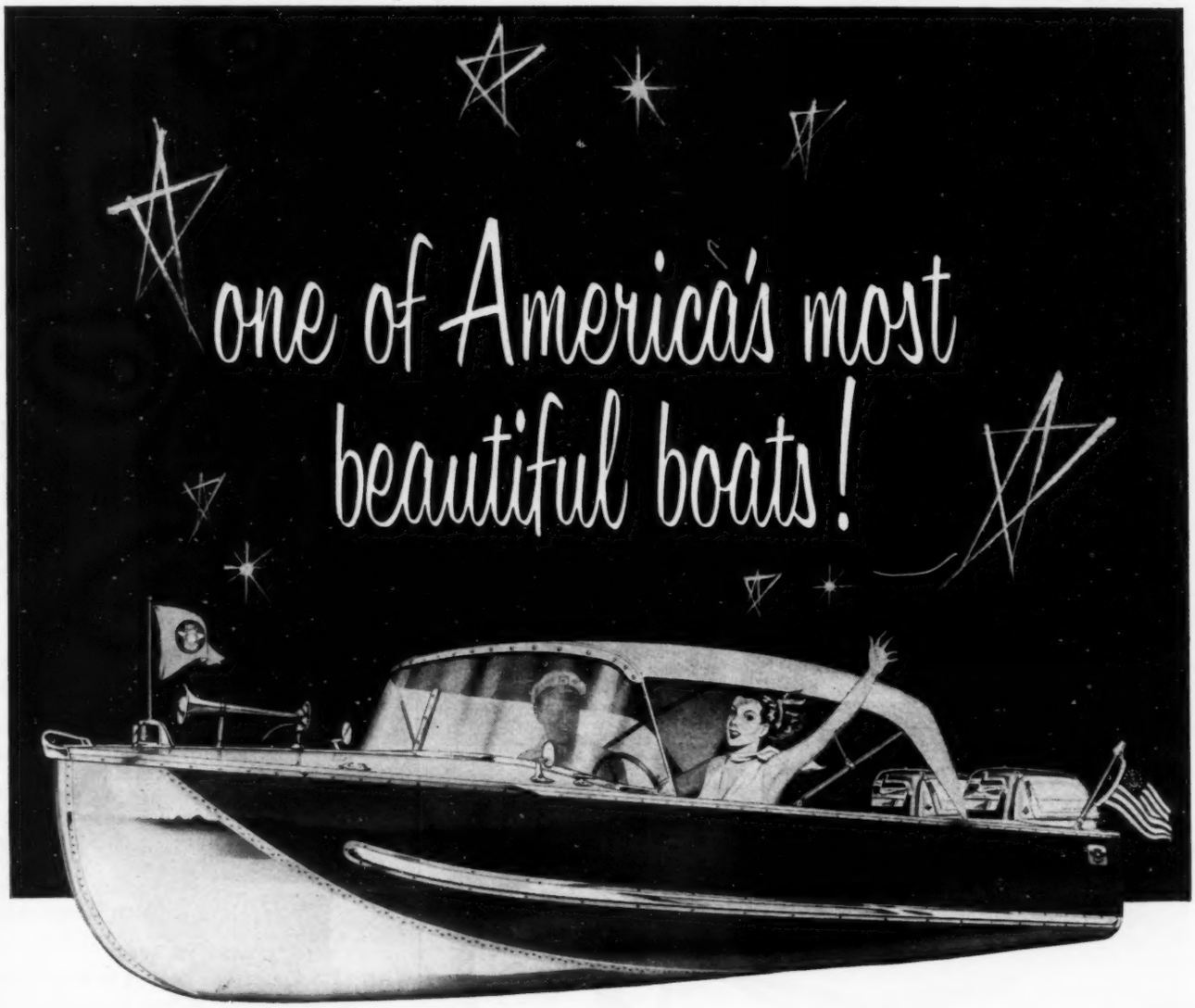
Could a boatman with average equipment and experience pilot his craft through the Panama Canal? To find out for POPULAR BOATING readers we assigned adventure writer Chuck Meyer to try. As we go to press we have received word Chuck has completed the trip through in his outboard and is sending in his photos and dispatch. Next month we'll give you the complete story.

Next month, as well, there will be a special Junior Skipper photo-story showing how sailing classes can be organized. Staff members Bill Wallace and Stanley Rosenfeld give complete step-by-step coverage. Chartering a boat has frequently proven to be a way to cruise in the craft of your choice without big outlay and upkeep. How to charter in various parts of the country is covered in a feature article. Merwin Dembling, who profiled Uffa Fox for us recently, has discovered the oldest active rowboats in the world and describes how they race, in the May issue.

One of the happiest of the hundreds of thousands of Midwesterners who visited the Chicago Boat Show is George Anderson Jr., of Kenosha, Wisconsin. He was awarded the $1,000 marine gift certificate given by POPULAR BOATING to celebrate its successful launching in the boating world. Mr. Anderson has a pretty wife and two small youngsters for crew to help him decide what he will choose to fit out with for the best in boating this spring.

WM. TAYLOR MCKEOWN
Editor





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This year, the beautiful, sweeping lines of AERO-CRAFT are available in brilliant polished aluminum finish or the new permanently fused "anodized colors" . . . choose your boat from a complete line of cruisers, runabouts, fishing boats and canoes . . . but, no matter which AERO-CRAFT you select you'll get more performance-per-horsepower, more maintenance-free economy, more built-in safety than ever before in history.

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READERS REPORT:

COMPASS FOG

To the Editor:

Your recent article about navigating in the fog makes me wonder if fog affects the compass. Just this summer I was fishing when a thick fog fell but I felt quite confident in returning by compass. Though the water was not rough, the compass jumped around so I could not be sure of my bearings. In a short while the fog lifted and I found I was way off, and the compass then became steady. Is there any connection between a jumpy compass and the fog?

J. R. Josephthal
Waterville, Conn.

There is a frequent connection between fog and a jumpy skipper, a factor which can cause many compass problems to occur.—Ed.

KNOTTY PROBLEM

In your seamanship lesson on small craft navigation, you state that the number of feet which would reel off a fish line from a traveling boat in six seconds would indicate the speed in knots. I tried it and find my boat idles along at 20 knots. No wonder the fish don't bite.

J. Sutphen
Dothan, Alabama

Author Robbie Robberson writes: "That typographical error certainly souped-up a lot of small boats. The description of using a fishing rig as a 'Dutch Log' should read—After the float settles down in the water, every ten-foot length that reels off in six seconds is a knot in speed. (Knots or marks can be put on the line every ten feet to aid in measuring.") *Everyone slow down.*—Ed.

AN OAR FOR ALL

I'd like to get my own oar in your fine magazine once in a while. I have some ideas that have worked well for me, and I'd like to hear hints that have helped other people.

Bill Fox
Akron, Ohio

Next month marine maintenance expert Bob Whittier will start a monthly department made up of boating suggestions and kinks which readers have found most helpful. He'll be looking for, and we'll be paying for, the best contributions to come in.—Ed.

SMALL VS. LARGE

Don't forget that millions of us are small boat owners and that's what we like especially to hear about.

Sanders Thomas
Beaumont, Texas

I like boats that are inboard and rather large. My name is Sammy Gardiner, and I am 12 years old. My hobby is designing boats.

Sammy Gardiner
Baton Rouge, La.

EAST VS. WEST

How does their boating in New England affect our boating in California?

B. L. Freeman
Manhattan Beach, Calif.

Florida, Seattle, and what have you! Let's have more east coast.

R. S. Fanelli
Manhattan Island, N. Y.

HITTING THE ROAD

Enjoy your magazine and look forward to trailering to some of the many interesting spots you have mentioned. Would like to know more about trailers, accessories and handling.

Morris Felt
Heber, Utah

A special issue is now being planned to cover the latest in trailers plus best ways and places to use them.—Ed.

REALIST

With POP. BOATING it was love at first issue. I like the fine articles, excellent photographs. In your pictures do not exclude the greatest invention since the steam boat: women. Being boatmen does not mean we don't notice attractive things like pretty girls. In fact, it may help.

Paul Manderville

Equip the "BUSINESS END" with a COLUMBIAN PROPELLER

You enjoy greater cruising pleasure when your boat swings a precision-made Columbian propeller. The product of over 50 years of engineering know-how and experience, they are designed to give maximum power, low fuel consumption and long, dependable service. You'll be glad you specified, "Columbian" for the "business end" of your boat!

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Now the outboard owner can select a propeller that is "customized" for every *hull-load-H.P.* combination and every *use* from low speed to water ski towing. Made of HIGH MAGNESIUM, aluminum base alloy for top impact and corrosion resistance. Gives more propeller "bite"...minimizes vibration...saves gas and oil.

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The Union, $495

. . . a comfortable boat, the kind you can bum around in, relax in, and still be proud of. "MFG" is sleek and good-looking, in a practical sort of way.

Take it fishing, for instance. Spill bait — or anything — and just wash it off. No fancy furbishings to spoil.

Race it against your buddies' boats — chances are you'll win. "MFG" is fast, smooth — and mighty tough.

(the ladies love it, too)

"MFG" makes a hit with the ladies because it's safe, easy to handle . . . soft riding, dry, beautiful. Trimmed with eye-catching mahogany.

The seamless lapstrake hull never needs sanding, caulking or painting — is never affected by marine life — never rots or corrodes.

Get yourself an "MFG" — it's your best boat buy! Write for free literature and name of your dealer.

Three handsome 15' 7" models, beginning at $495, f. o. b. factory.

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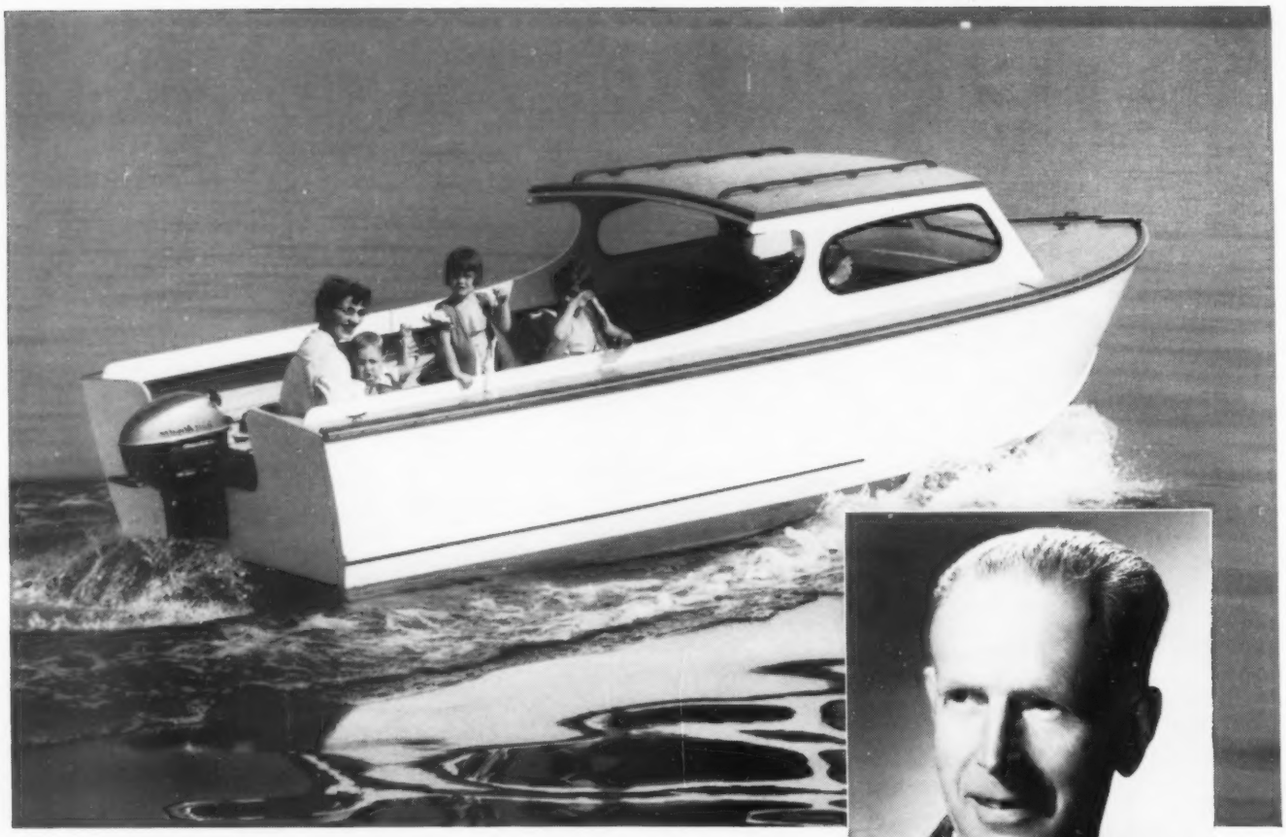

One of the nation's leading authorities on design and construction of pleasure craft, Edwin Monk of Seattle has designed over 2,000 boats in the past 21 years. Plans for 18′ Monk-designed day cruiser in photo are available; see below.

"Fir Plywood*–First Choice for any boat up to 24 feet!"

Edwin Monk

Edwin Monk, *Naval Architect*

"Since World War II, the trend toward fir plywood in small boat construction has been tremendous. Its combination of stamina, size and light weight plus low cost make it first choice for any boat up to 24′. And even on larger boats, it is superior for decks, cabin floors and bulkheads."

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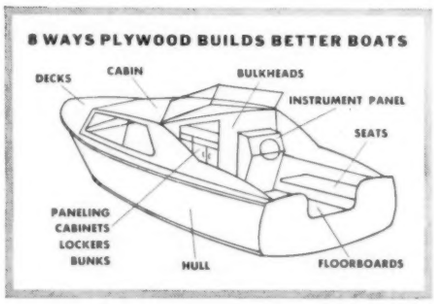


***FOR ALL MARINE CONSTRUCTION USE ONLY EXTERIOR FIR PLYWOOD** *"Ext-DFPA" means waterproof glue*

8 NEW BOAT PLANS with illustrated step-by-step instructions available from your lumber dealer. (Or send 25¢ for each to Douglas Fir Plywood Assn., Dept. POB, Tacoma, Wash., U.S.A. only.) • 8′ Pram (Plan 30) • 11′ Outboard (Plan 35) • 13′ Outboard (Plan 40) • 14′ Punt (Plan 45) • 15′ Outboard (Plan 50) • 16′ Runabout (Plan 55) • 18′ Day Cruiser (Plan 60) • 20′ Cabin Cruiser (Plan 65).

SEAMANSHIP

Test Your Boating Knowledge

Can you make the right decision instinctively? Check the questions below and see how you score

By ELBERT ROBBERSON

JOIN the Navy, Coast Guard, Merchant Marine or any of the other of our responsible organizations of seafarers, and you'll be expected to possess certain qualifications before being entitled to take a boat out on your own.

Not so, so far, in civilian life. Anyone can buy a boat and do with it what he will. If this results in mishap or mayhem, suit in a court of law may result. But again, it may not—due to the present lack of private-boat operating standards and a uniform enforcement program. The tremendous spread of boating as a national pastime, and the conduct of a few irresponsible or ill-informed beginners (as well as that of a few old-timers who would be "pushers" in anybody's subway) has resulted in an unpleasant-incident rate that has caught national attention. So we have hanging over us the prospect of laws that may regulate boat operation as closely as that of any vehicle on the highway. If such laws should clamp down, it would be too late to cry—so it would be much better for boatmen to realize now their responsibility and become Seamen. It isn't difficult. The purpose of the present series of articles on Seamanship is to show its simplicity, and how easily one may become accustomed to good practice.

1. You are proceeding in an outboard toward open water in a narrow channel. A 40-foot cruiser under power is approaching head-on. You should:
   (a) Slow down.
   (b) Blow your whistle.
   (c) Turn right.
   (d) Turn toward the closest shore.
2. A powerboat is entering port and a sailboat on the starboard tack draws up astern.
   (a) The sailboat has the right of way.
   (b) The powerboat should turn into the wind.
   (c) The powerboat should hold course and speed.
   (d) The powerboat should wait and see what the sailboat is going to do.
3. In power craft, the "danger zone" is:
   (a) Around the engine.
   (b) Around the propeller.
   (c) Off the starboard bow.
   (d) The direction from which another boat is approaching.
4. When passing another boat:
   (a) Go on either side as long as you keep clear.
   (b) Keep to the right.
   (c) Give the other boat clearance to the center of the channel.
5. On crossing courses, other powerboats have right of way:
   (a) When they whistle for passing.
   (b) If they are approaching on the starboard bow.
   (c) If they obviously have greater power and speed.
6. When you push an outboard tiller to the right:
   (a) The bow swings left.
   (b) You should back off on the throttle.
   (c) The stern swings to the right, and you should make sure of your clearance on that side.

Here is a quiz, reviewing material covered to date, by which you may gage your knowledge of Seamanship. The first Seamanship examination the author took, some years ago, had questions such as "What is an orlop," and also required untangling, to the tune of a stopwatch, about a cubic yard of hopelessly tangled hemp thrown out on deck. Fortunately, memorizing archaic nautical terms and having a degree of dexterity that would shame a Bombay pickpocket are not required to be a civilian seaman. *Common sense, application of some of the same rules of the road we use on the highways, and awareness of the responsibilities that fall on the shoulders of a person taking charge of a boat are practically all that are required.*

The following questions have several possible answers—some of them may get you by, or even be good second choices, but one of them embodies the thought that should instinctively come to a boatman. The correct answers, if they have not come automatically, can be reviewed in the series of articles which have appeared from November to the present in the POPULAR BOATING Home Seamanship study series.

Check your score on page 52

7. In approaching a landing,
   (a) Always come up into the wind.
   (b) Come up into wind or current, whichever is stronger.
   (c) Observe traffic rules, and come in right-side-to.
8. To land a boat alongside a float:
   (a) Come in fast, for best steering, then at the right moment throw the engine into reverse, full speed.
   (b) Call to someone ashore to catch your line.
   (c) Approach slowly from the leeward, and avoid the use of reverse gear as much as possible.
9. A nine-foot dinghy with a temporarily attached outboard motor is required by the Coast Guard to carry:
   (a) A combination red-green bow light, whistle or horn, fire extinguisher and life preserver.
   (b) Nothing at all.
   (c) A lifesaver for each person.
10. If an outboard boat is less than 16 feet in length it can navigate at night:
    (a) By flashing a light when other boats approach.
    (b) If it carries a combination red-green light forward, and a white light aft.
    (c) If it is operated carefully and returns to its mooring not later than one hour after sunset.
11. A fire extinguisher is required in an outboard boat:
    (a) If spare cans of fuel are carried.
    (b) If the boat is operated by remote control.
    (c) Only if the motor compartment is enclosed.
    (d) When even a small space on the boat is enclosed.
12. Flame arresters are required on engines:
    (a) Only if they have been "hopped up."
    (b) Only on inboards.
    (c) On converted automobile engines.
    (d) When fire extinguishers are not required.

(*continued on page* 52)

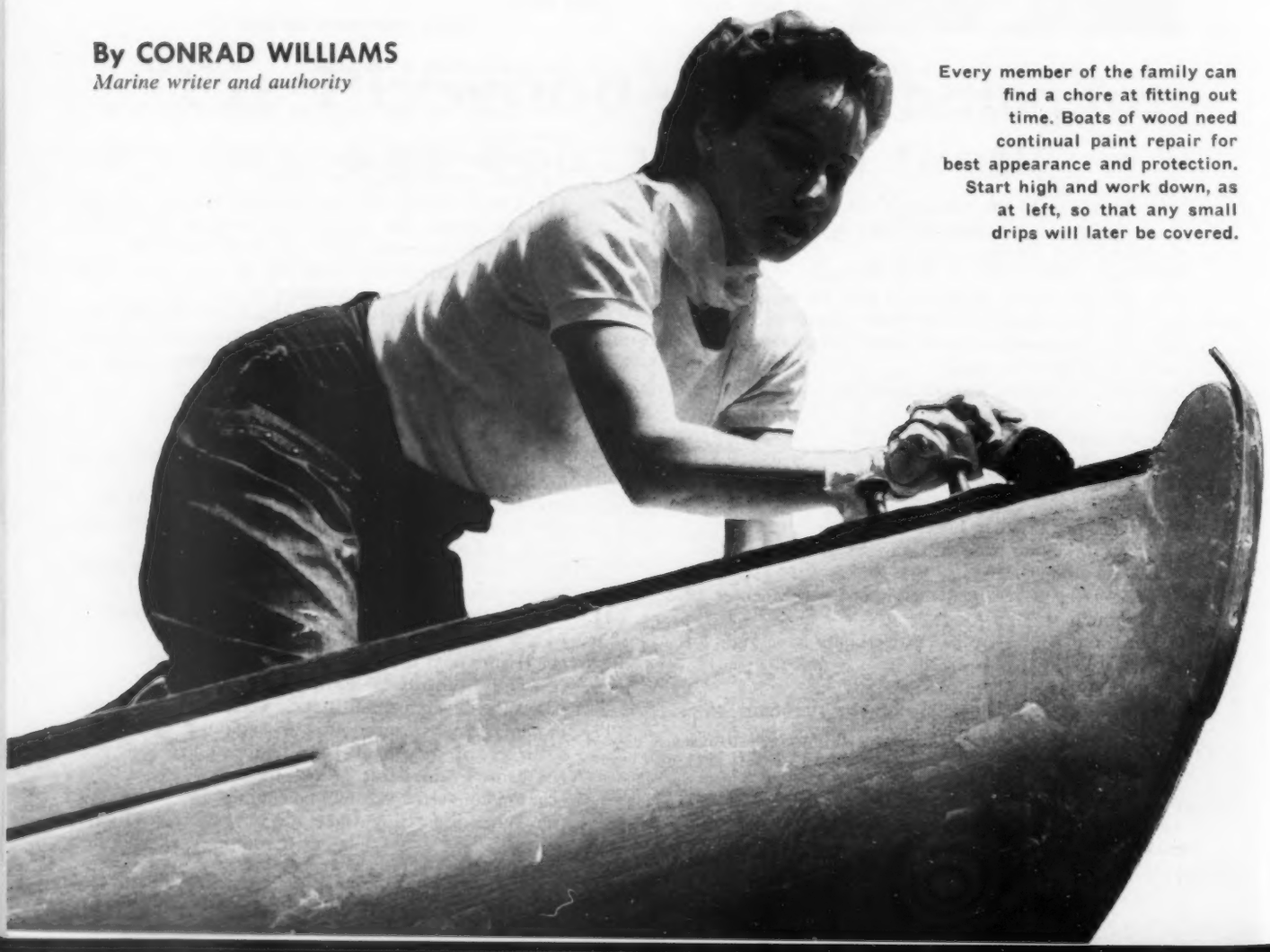
Fitting-Out for

New products and procedures can make commissioning this year more simple and satisfactory than ever before

PREPARATIONS are part of the fun when the new season brings round once more the time for southern boatmen to re-examine fittings and haul out for new bottom paint—northern skippers to pull off winter covers and go into commission for another summer. Boats and blossoms begin to break out in back yards coast to coast.

Though maintenance, ideally, goes on all year, spring is, never the less, a good time for inventory and appraisal. With the rapid strides in craft of plastic, metal, and molded ply that need less upkeep, there is a chance for many boatmen today to get into the water without the hours of labor that used to be necessary.

By CONRAD WILLIAMS
Marine writer and authority



Every member of the family can find a chore at fitting out time. Boats of wood need continual paint repair for best appearance and protection. Start high and work down, as at left, so that any small drips will later be covered.

Spring

Rosenfeld photos

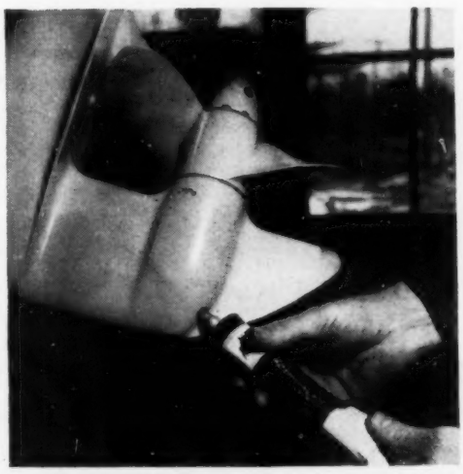
If major repairs prove necessary on a craft of wood, examine surrounding planking for any signs of rot. Sanding down to bare wood makes good base for paint.

But even if your boat needs no painting this year, give it a careful inspection. Is all the hardware in place and securely fastened down, or might a cleat let go if snubbed sharply later this year with a docking line? Is the mooring bit bolted through the deck securely so that it could stand the surging of rough water while riding at anchor?

And do you have an anchor along, even a small one for the dinghy? Modern design has made possible anchors which rely on structure rather than weight to hold them down. Small models are now even furnished with plastic coating to prevent marring your boat; folding designs make storage possible in a small space. And have you seen the new aluminum boat hooks that float and have a flashlight attached for night docking?

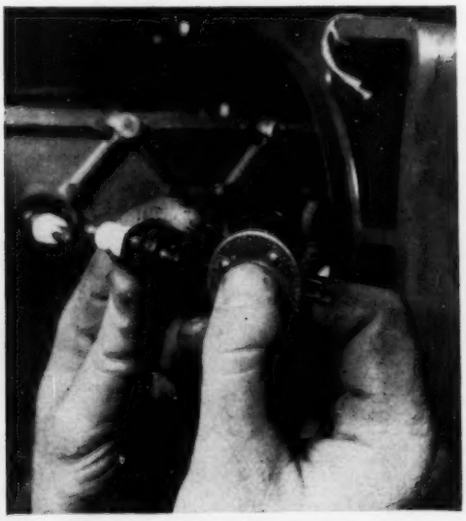
Will your boat be kept pulled up on a beach, tied to a dock, moored offshore? In each case you will want to have ropes aboard for anchoring and tying up. If you want to be nautical you will refer to them as lines, but in any case you should choose them with care. A braided-type clothes line will *not* do around a boat. Manila is the sea-going standard, and if you have not tried nylon for a springy mooring line you may find it well worth the slight extra expense. It is much stronger as well.

Though you normally never anchor, having one along is good safety insurance, and the longer your anchor line, the better the holding power. (*continued on page* 79)

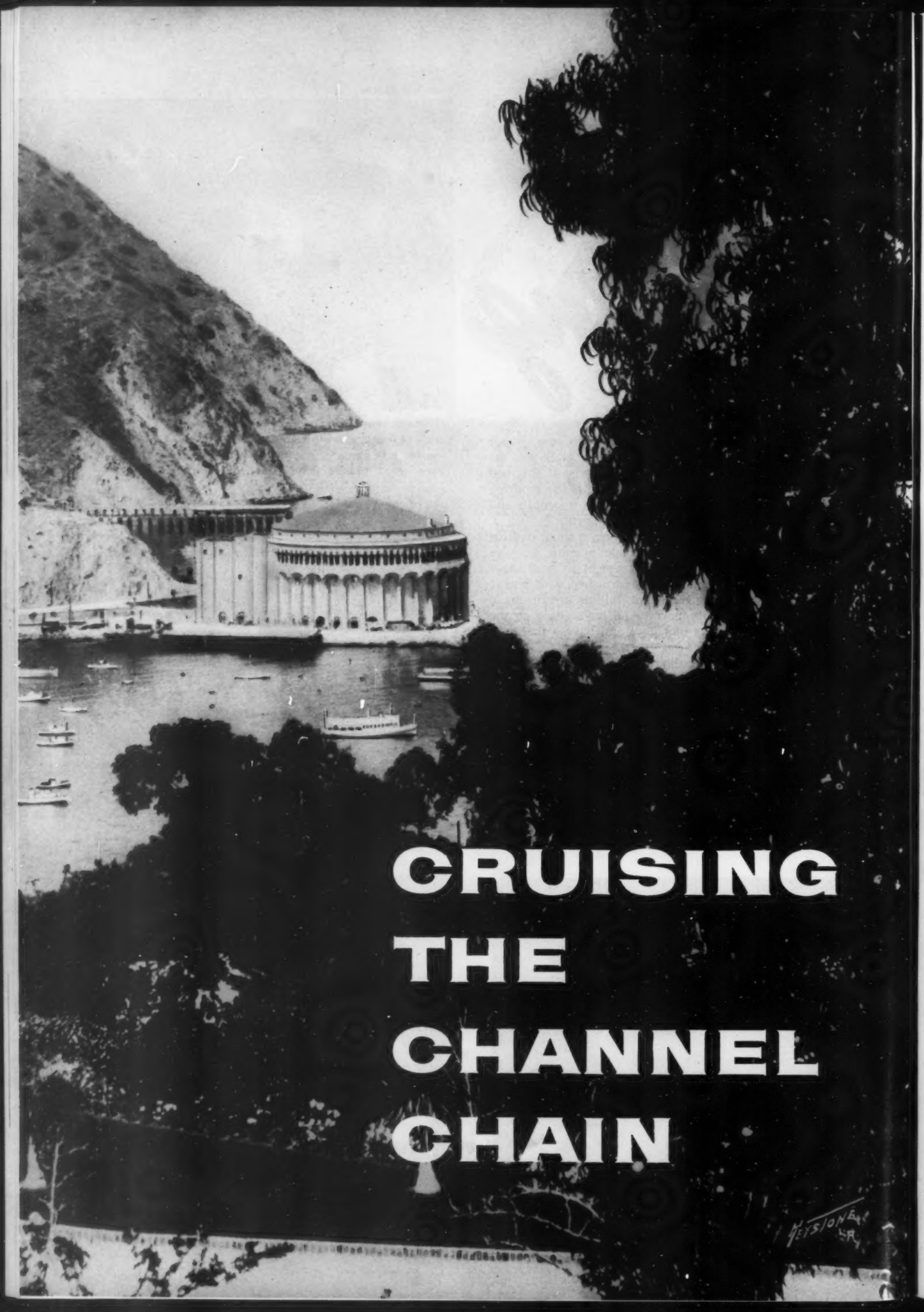


Outboard maintenance can be done indoors where motor should have been stored. Here waterproof grease is added to lower unit.

Covers first come off of craft stored outside for the winter. Number frames for easier reassembly at end of season. Next, hose down with fresh water.



Part of every seasonal check-up is spark plug cleaning and gap test shown. New plugs can be a small but wise investment.

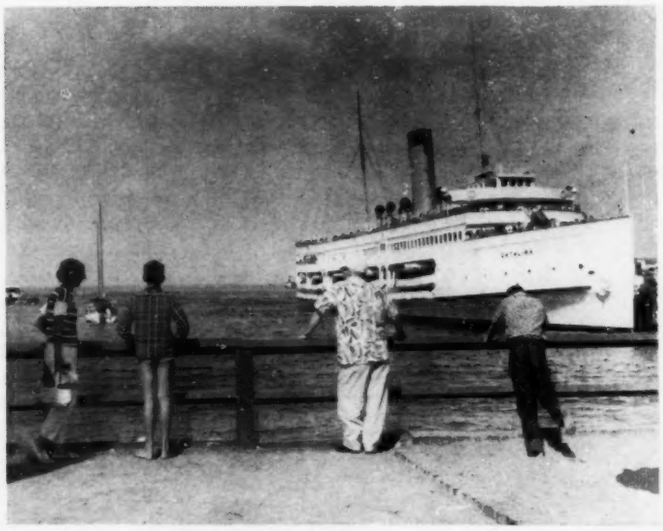


CRUISING THE CHANNEL CHAIN

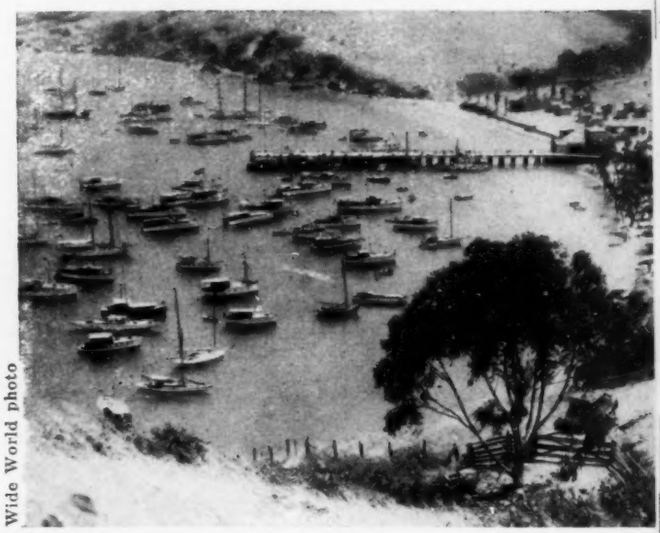
Distant isles, goal of all cruising boatmen, are within easy reach from Southern California

By ROBERT LEE BEHME

West Coast roving correspondent for POPULAR BOATING



Catalina, best known of the Channel Islands, may be reached by boating skippers and tourists alike.



Wide World photo

Small boats and large, sail and power, anchor off the beach of this attractive Catalina cove.

FROM Maine to the Florida Keys and from Washington's San Jauns to San Diego, predictions are that America's off-shore islands will record their largest numbers of cruising visitors this year. There are many reasons for this growing trend.

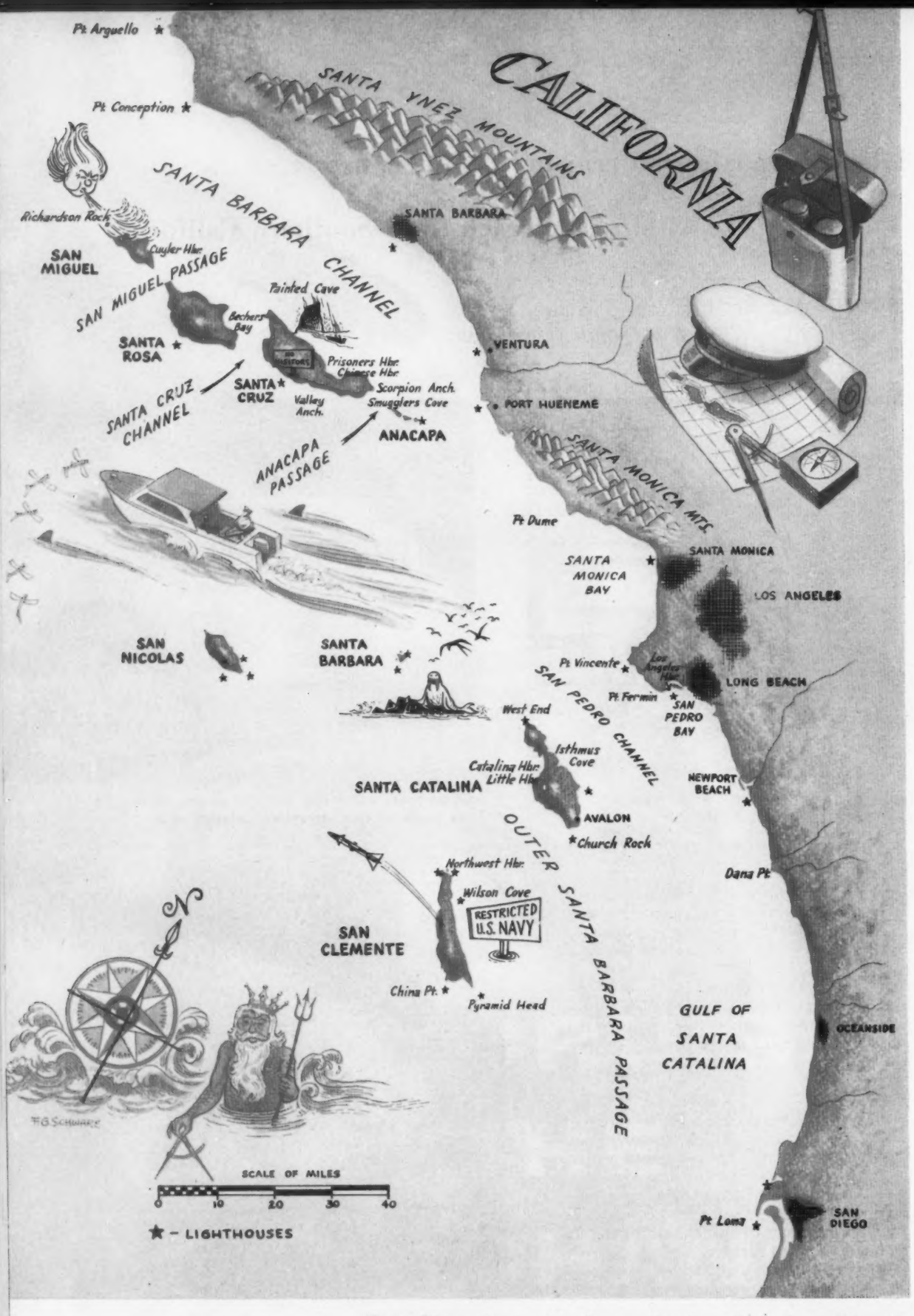
Off-shore islands, reached only through open seas, provide more high sea adventure than any other kind of cruising. Heading off-shore with the spray whipping over the bow and the wheel working hard in the hand, a skipper has command of more adventure than the best of landlocked lubber tales.

Because of their distance from the mainland, these islands provide natural destinations for weekend cruises. Although many are within easy reach of most mainland ports, off-shore islands are often distant enough to couple sufficient amounts of open seas and cruising time with long hours of shore relaxation on the islands. The open seas between mainland and islands give the entire crew an opportunity for a good workout, navigation and fishing in dosages not duplicated in closed harbors.

Most of the islands off American coast lines have long figured in history. On them skipper and crew can walk in the footsteps of time. Such islands, with historic ruins, old shipwrecks, markers and harbors, are rich in adventure.

Good examples are California's channel islands. Situated in the Pacific from latitude 31° to 35°, in the warm waters off the Southern California coastline, they are made up of eight islands within a 100 mile radius of one of America's largest cities. Their lay give San Diego, Los

Otto Bayer and family leave their mooring in Balboa at Newport Beach and head toward mid-channel at the legal 5-knot speed. After passing the breakwater they will increase throttle for their channel crossing.



Catalina is not alone in beckoning the boatman

San Miguel, Santa Rosa, Santa Cruz, Anacapa, San Nicolas, Santa Barbara, Santa Catalina, and San Clementa make up this chain of islands that can be reached by the boatman from the mainland. Though not all are open to visiting skippers, they offer check points and, in most cases, harbors of refuge or pleasant vacationing.

Angeles and Santa Barbara enthusiasts a wide selection of landscape, seascape, adventure and history.

The eight islands, San Miguel, Santa Rosa, Santa Cruz, Anacapa, Santa Barbara, San Nicolas, Catalina and San Clemente, provide good waters, fine harbors and fine fishing. Some islands are privately owned—two are restricted. Most are currently available for landing.

Typical of the skippers who visit these islands is Otto Bayer, of Newport Beach, California. Otto is an engineer and an ardent boating fan. His boat is a beautiful 16-foot Glasspar cruiser, the Mary M. Powered with a 30-hp Johnson outboard, he's taken the boat into many of the interesting channel island harbors as far north as Santa Cruz.

On weekends Otto will round up his family, his wife Mary and his son Pete, stock the boat with provisions, swimming gear and fishing tackle and weather clothing and take a heading for one of the islands.

Otto's favorite, as with most yachtsmen, is Catalina where the friendship of fellow yachtsmen makes the weekend a mixture of open sea cruising and evening harbor visits aboard other craft. The trip is typical of the off-shore cruising available in the channel islands.

Catalina is 26 miles off Los Angeles shore, on a southwest heading out of Balboa's harbor. Crossing time varies—generally between three and six hours—depending upon the craft and its power. Sails often carry a light displacement yacht across in five hours. Average time for power boats is four hours.

When Otto plans a weekend trip to Catalina he normally

Glasspar 16′ Del Mar outboard cruiser was used for the author's Catalina crossing, usually a 4 to 6 hour trip.

Only minimum provisions and gear are brought aboard by Otto Bayer and family since Avalon has many shops.

The Yacht Club, famous Catalina landmark, faces moorage for over 200 craft, assigned to position by the harbormaster.

Weekend boatmen may sleep aboard or find plentiful lodgings and entertainment ashore. No visiting cars are allowed.

stocks only enough provisions for the trips across, since the main harbor, Avalon, is tightly habited by shops and stores plus a covey of excellent restaurants with reasonable mainland prices.

In addition to the compass, a necessity for the cruise, Otto carries two portable pressurized gas cans for the Johnson. On an easy Catalina trip, with light seas running, he can make the crossing with ⅔ of a can. If seas run heavy the trip may take a full can. The second can is always carried as an emergency spare.

Otto tries to leave his Balboa mooring early in the morning, seldom later than nine, since weather conditions in Southern California have long established blustery morning

(*continued on page* 66)

Quiet water greeted the returning outboarders as they reached Balboa's breakwater at dusk on their return.

boatman of the month

LOU FAGEOL

By BILL WALLACE

Boating editor and correspondent

LAST January 23 the North River Power Squadron of New York City was privileged at a dinner in the Downtown Athletic Club to hear a talk by Louis J. Fageol entitled "30 Years of Progress in Power Boating." Fageol established the point that "the performance available in today's marine hulls and engines can be traced to valuable experience gained in outboard and inboard racing."

He continued: "If a Gold Cup boat is to survive the punishing grind of 90 miles at speeds in excess of 100 miles per hour, the hull, engine, gearbox, fuel lubricants and all other parts must be highest quality. It is this search for the best that has resulted in many developments now available to the boating public."

This was not exactly an original thought, and Fageol overlooked competition's most notable contribution to pleasure boating of recent years—racing's gift which had put the speaker in a Seattle hospital for 23 days in the late summer of 1955. With time heavy on his hands, Fageol then designed from his bed the new V-I-P (vertical-inboard-power) marine engine now sold under his name, a powerplant destined to become a major milestone for boating, if its early acceptance is an accurate yardstick.

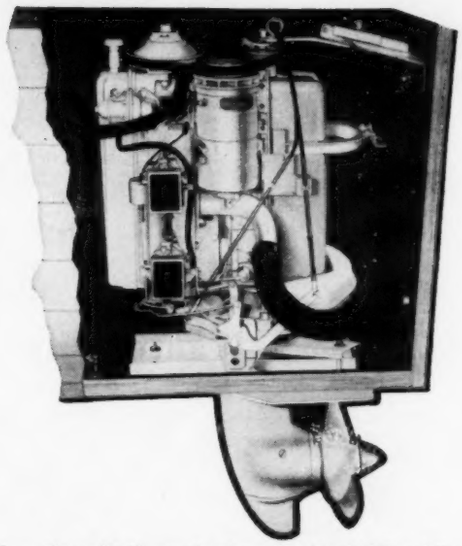
In fact more people may come to know the Fageol name through "the engine that stands on its head" than by association with the Fageol racing career.

Those 23 days—he was released once but collapsed at the discharge desk—in the Seattle hospital neatly bridged both past and future for Fageol, today a 50-year-old corporation president from a little college town in Ohio called Kent. Fageol went into the hospital, seriously injured with two cracked vertebrae, a severe concussion, and multiple cuts and bruises, because he was a race boat driver who had cracked up at 140 miles per hour. And he went out a business executive with a promising idea. Fageol has played the corporate role ever since, and, like Rocky Marciano, he is never going to "unretire" back to the race boats.

The firm our Boatman-of-the-Month heads is a unique organization called the Twin Coach Company, now com-

In his home in Kent, Ohio, Louis J. Fageol stands in a room crowded with trophies of nearly 30 years of powerboat racing from outboards to unlimiteds.

Three-time winner of the Gold Cup, this racing engineer is now confidentally facing a new kind of competition with his V-I-P, the "engine that stands on its head"



Lou thought through plans for the V-I-P while recuperating from 140 m.p.h. flip in Slo-Mo V.

pleting a period of transition. The motto is "Transportation for skyways, highways and waterways."

Twin Coach makes wing and fuselage assemblies for military aircraft (the Boeing B-52 jet bomber, others by Grumman, Republic and North American) on a sub contract basis, a field that will represent about 55 per cent of the firm's estimated $30 million sales in 1957.

The company is on the waterways with the Fageol 44 marine engines, introduced in 1955, and on the highways with the "Pony Express", a midget-sized panel truck designed for the U. S. Post Office. Also there is the Convertible, a combination bus-truck-ambulance popular with the Armed Forces.

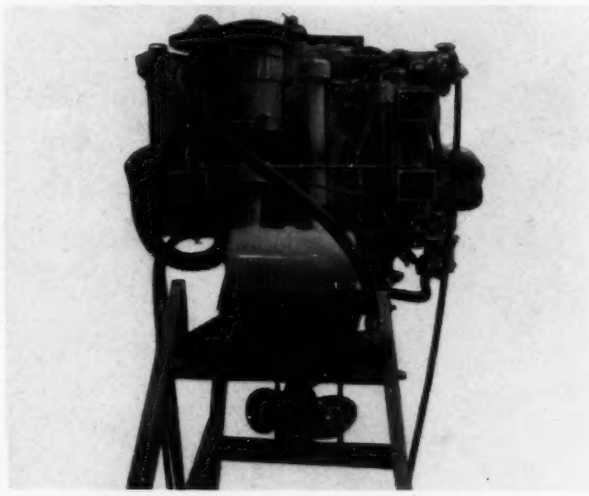
This bus is the last vestige of what was for 30 years the heart of the Twin Coach Company, manufacturer (from the ground up) of busses for urban use.

Frank R. Fageol, Lou's father and the present 75-year-old chairman of the board, founded the company and did well by it. Twin Coach busses transported millions of Americans over hundreds of city franchises for many years.

Bus manufacturing is no longer profitable, and Twin Coach sold its interests about the time it picked up its boating activities.

The marine division was a natural because Lou, who succeeded his father as president in 1945, had a lifetime of boating exposure behind him.

(*continued on page* 70)

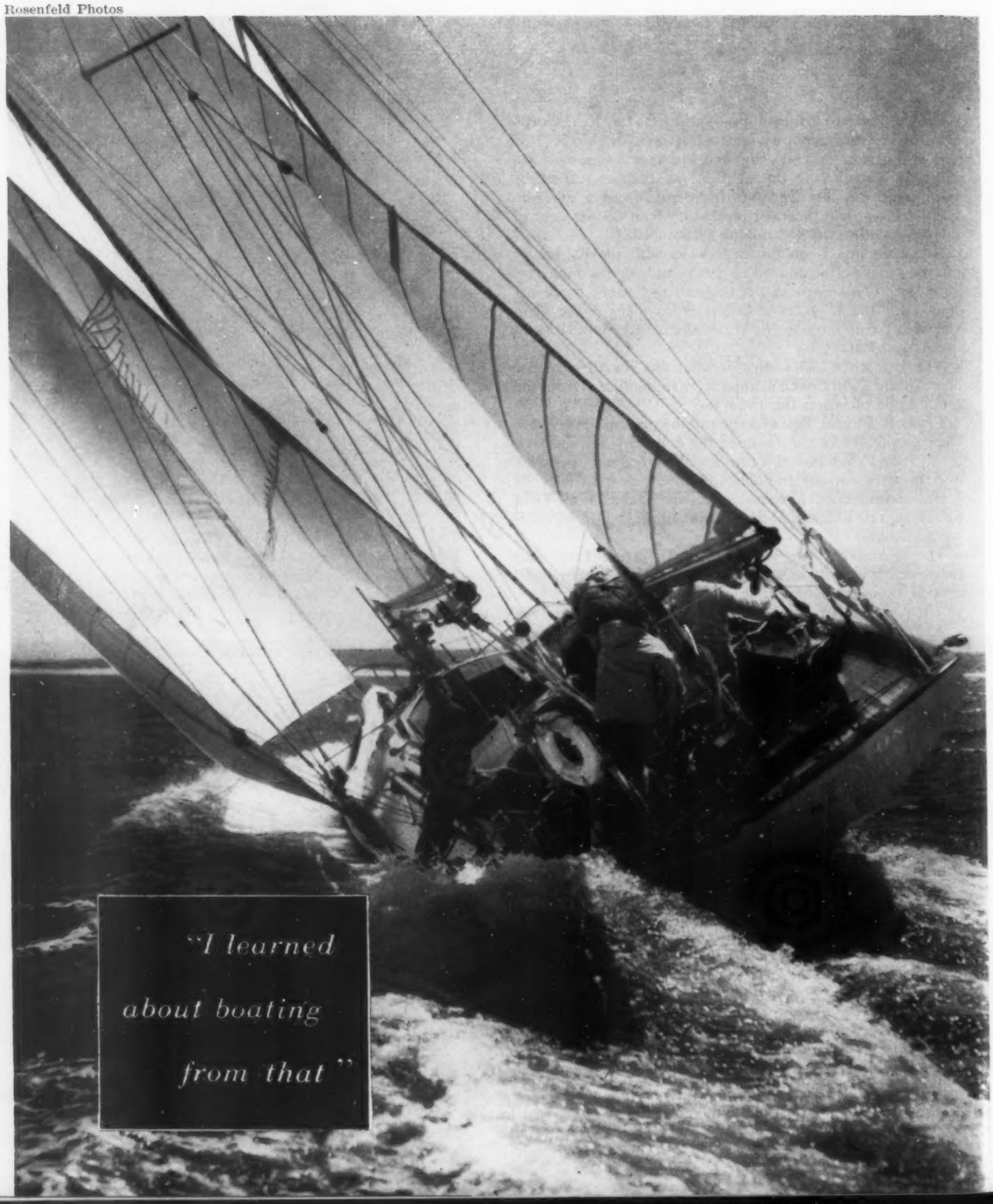


First published photo (above) of the new V-I-P 88, this exclusive shot shows how Fageol has bolted two of his engines together to produce an 80 h.p. powerhouse of 280 lbs. that will go into production this summer, fit mounts of earlier models, cost $1350.

In the "grand old lady," Seattle and Stanley Sayres' pride and joy Slo-Mo-Shun IV, Lou Fageol captured the Harmsworth Trophy in 1950, the Gold Cup with Joe Taggart in 1953. With Slo-Mo V he took '51 and '54 Gold Cups.

As waves of water roared across the bilge in the dark, they knew that unless the leak stopped gaining on the one pump left— beautiful Katuna would founder in the storm

Rosenfeld Photos



Offshore and Sinking

By LEONARD VAN DALEN

"VAN. . !"

"Hunhh?" A cold, wet hand was shaking me from warm sleep back to the trip. In the night, I heard water roaring by the hull next to my ear.

"Van, wake *up*. We've got *water* in the boat!"

"What a'you mean?" I came up on elbow, trying to wipe the sleep away from my eyes. "She's leaking?"

"Listen!"

I started to reach for the lightswitch over my bunk, but *Katuna* buried her lee rail in a knockdown that laid me back against the lee ceiling. It was wet, the edge of the mattress was wet, and I heard *tons* of bilge cascading under the cabin sole, rushing over floor timbers and frames, sloshing through lockers and up the inside of the planking behind me. On deck, there was a clatter of blocks and luffing as the helmsman reacted to the puff by bringing her back too high into a whistling new breeze. The bilge went rumbling back again.

"Water. . !" I flailed around in the blankets trying to get my balance. "She's half *full!* Hit that light—let's look around."

There was some pawing on the bulkhead and the flip of a switch.

"Hey, look here. . ."

I got up on the edge of the bunk, swung my feet down on the settee and turned to look at the light. The bulb was burning with a cold, dull orange glow. There wasn't much more illumination to it than the end of a lighted cigarette.

Pete's shadow-black arm reached out and flipped the switch several times. No improvement.

"Water's already over the batteries," I yelled. "When did all this hapen?"

" 'Squall on your watch below—nor'easter came in behind it. She was O.K. before that because I made coffee at. . ."

"Well, get the pump going!"

"Think there's enough juice?"

"Not the *electric* pump—the hand pump. Use the hand pump in the cockpit."

"Right," he disappeared toward the companionway. "Better call Al."

I hit the cabin sole already moving and handed myself into the forward cabin.

(*continued on page* 74)

An offshore cruising and racing beauty, the Katuna, more recently named Sagola, is 52′ overall, draws 7′ 6″, and has a 12′ beam.

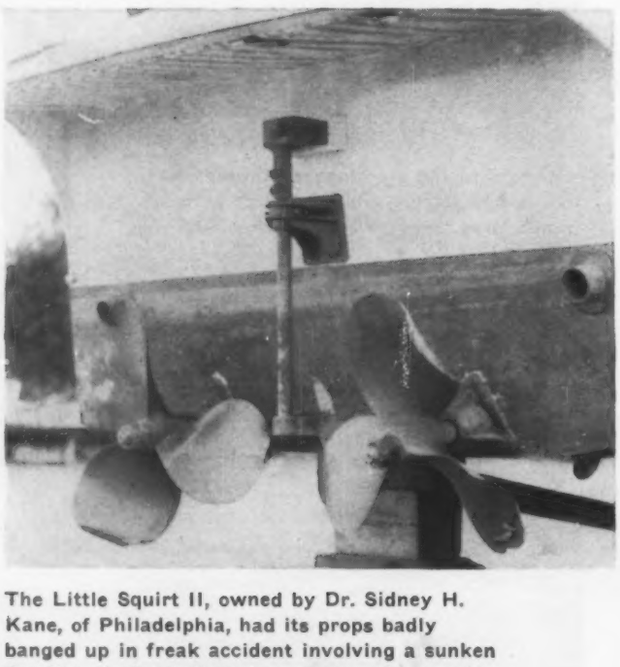
A yawl of racing prominence, Katuna was designed by Carl A. Alberg; built by Simms Bros.; has a Gray Marine auxiliary.

Burying more than her 36′ of waterline as she boils along, Katuna can pile on and lug 1300 square feet in area of her Ratsey sails.

The wheel goes around—but not always to your best advantage. Here's why, and what you can do about it

Propeller

By HANK WIEAND BOWMAN
Boating author and experienced skipper



The Little Squirt II, owned by Dr. Sidney H. Kane, of Philadelphia, had its props badly banged up in freak accident involving a sunken derelict airplane. Note torn-away rudder post. As shown upper right, she would not plane until proper formula was again found.

BOATS for years have been affectionately referred to in the feminine gender, but unlike others of the female specie, their slips seldom show. Though your boat's slip does not show, the relative movement of the hull through or over the water in relationship to the hull design, weight, condition and a number of other factors determines the *slip efficiency* of your propeller's performance. Many boat owners will debate long over the selection of some new accessory item, the type of fabric for cushion upholstery or argue heatedly about the relative merits of different brands and heat ranges of spark plugs, but when it comes to propellers their interest usually flags. Even if the prop was beating about in full view, rather than buried somewhere under the stern of the boat, this would be true because, lacking a simple formula for selecting the proper propeller, people view its purchase with a jaundiced eye. As it is, propellers are cloaked in an aura of mystery that can baffle the smartest boatman. Frankly, no easy panacea for your propeller problems exists, but an understanding of the problems concerning propellers' function and their selection may serve as a guide to improve your boat's performance.

In the past there has been considerable misconception about the function of a propeller. Far too often it has been compared to the performance of a wood screw (hence its nickname) being driven into a solid substance. Propellers are frequently described in terms of diameter and pitch. Thus, a 10″x14″ propeller indicates a propeller of 10″ diameter, that is 10″ across the extreme circumference formed by the tips of the rotating blades and one which

advances 14″ in its theoretical forward progress in one complete revolution. I say "theoretical" because this is where the slip begins to show.

A propeller, rather than acting as a screw through a solid, actually imparts forward motion to the boat in the form of a thrust, which is produced by the rotating propeller accelerating a mass of water backwards. In essence a whirling propeller in displacing water is acting more as a jet than a screw. If, for example, the propeller were to be replaced by a hose and the powerplant, instead of rotating a driveshaft, were to pump water through this hose

Principles

Sea sled shown here is mushing along at a non-planing speed because of improper propeller formula; before wheel trouble developed she romped along at amazing speed of 40 m.p.h.

Even brand new propellers can be out of alignment. Most well-equipped motor repair shops have propeller indicators, such as this, which will determine trueness, pitch and diameter.

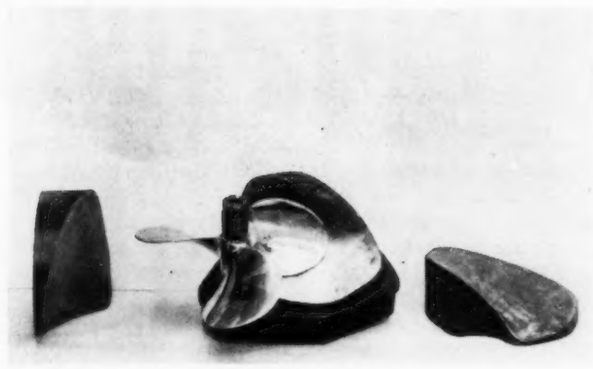
at high velocity, forward motion would be imparted to the boat. If the screw-like theory were to be applied, then the diameter of the propeller would have no appreciable effect, only pitch would be important. A simple speed formula could be calculated for any propeller of a known pitch.

For example: $\frac{\textit{propeller r.p.m. x propeller pitch in inches}}{12}$

divided by 88 (the number of feet per minute traversed at one mile per hour) would, without slippage, give m.p.h. Actually, the individual who is looking for greater propeller efficiency must apply such a formula. However, since the formula offers only a theoretical speed, he must also use a calibrated water speedometer or make his runs through an accurately measured distance in order to figure out his actual speed. The formula calculated speed and actual speed will be far from the same because a tremendous number of factors will operate to make the theoretical figure far higher. The difference between the two figures represents miles per hour slip.

In underway tests, the percentage of propeller slip and actual propeller efficiency can be mathematically computed. A tachometer reading adjusted in terms of known gear ratio on the outboard, or reduction gear on the inboard, will indicate the number of revolutions made by the propeller. Assume for a moment that a given boat's propeller is operating at 1500 r.p.m. with a 15″ pitch propeller. Assume, too, that an accurate speed check of the boat indicates that at that r.p.m. the boat moved at 16

(*Continued on page* 80)



If excess vibration occurs, have your propeller checked. Pitch blocks (above) used for this purpose are carried by many outboard repair shops and inboard marine dealers. A moderately damaged prop can be repaired by tapping it back to alignment (see below) with a soft mallet.

Marine paint can provide protection and attractive color if properly applied. Here are the basics for best spring refurbishing of your boat

A New Coat For Your Boat

By ELLISON MICHEL
Experienced boating maintenance authority

Remove old finish first if necessary. For flat surfaces a liquid remover is satisfactory, while vertical may need paste.

Follow directions carefully for brand of remover used. Apply several coats on heavy paint before starting to scrape.

SPRING signals the season for boat painting in every section of the country. Craft that have been laid up in boatyards are readied for launching, and boats that have wintered in the water are pulled out for a similar treatment.

Fortunately for the boatman, every year recently has marked the introduction of new paints with improved characteristics for marine use. The paints offered for 1957 have an even greater variety of colors, plus claims for substantially stronger wearing ability.

The experienced and budget minded skipper may skimp in some other departments but does not try to get by with substitutes for true marine paint products. He may have learned from experience that while house or indoor paints may suit their special purposes well, they will not stand up under the abuse the coating on a boat will receive.

While sailing or powering along, your boat will surely receive some spray, and this constant wetting and drying of the surface will cause an ordinary paint to flake or crack. Hot sunlight, cool nights, heavy dew, and unprotected splashings from storms and waves all conspire to break or wear down the ordinary painted surface. An average boat will "work" as well, giving slightly to the waves it crosses, and a wooden-planked craft will, of course, swell as it absorbs water. For this reason your paint must be more

Orlando from Three Lions

Choose your bottom paint wisely and apply it carefully. Anti-fouling paints used to protect hulls for salt water sailing are expensive but have been carefully formulated and instructions must be followed carefully. Mix the paint carefully to be sure the barnacle and grass repelling agent is thoroughly stirred in; then follow the manufacturer's directions explicitly when launching is required before paint dries.

Sanding sets the stage for a smooth final surface. Do not skip this important step.

Small boats are easiest to paint if inverted. Start painting at highest point and work down to prevent spatter.

Varnish will give the most attractive finish to unpainted decks and bright work. Several thin coats wear best.

elastic than the average product you may use shore-side.

Marine coatings may be divided roughly into brightwork, topside, and bottom coverings. Brightwork includes any wood surfaces where a clear coating is used to let the texture and color of the wood show through. Mahogany, and the many types of wood similar to it, are frequently used in this way. Varnish is the usual brightwork coating. Wood which may have discolored from exposure may be bleached with one of the standard products available at paint stores. Many of these are based on oxalic acid and should, therefore, be handled carefully, and the powder which remains after the bleach has dried should be brushed away without inhaling.

Varnish only on days which are not too humid and have a minimum of breeze to stir up dust. Do not stir varnish, since this will create bubbles. Flow varnish on rather than brushing it out, but do not apply it so thickly that sag marks will occur. Old hands usually use a minimum of three or four coats—each applied after the previous one has fully dried and been very lightly sanded or pumiced.

Some boatmen are now experimenting with plastic-based varnishes now on the market, and the use of fiberglas-binding resins as a varnish substitute. Fiberglas, itself, may be applied over brightwork to give a transparent yet very protective coating. Other parts of the boat may be fiberglas-treated with pigment added to give a permanent color, but all undercoatings of previous paint should first be removed.

Paint used inside the cabin or lockers of your boat should be of a type that does not tend to mildew. Your paint store may be able to supply an additive which is claimed to help retard mildew. The same moisture which can cause fungus mold can also encourage dry rot so anti-rot chemicals should be applied to any susceptible areas before the paint goes on.

Topside paint may be of gloss, semi-gloss, or matt finish. Boatmen who prefer white above the water line frequently will choose a semi-gloss paint which will chalk off and slowly wear away during the season, dropping off any accumulated soiling in the process. Scrubbing down the topsides will brighten them in a way that is not possible with an enamel surfaced paint.

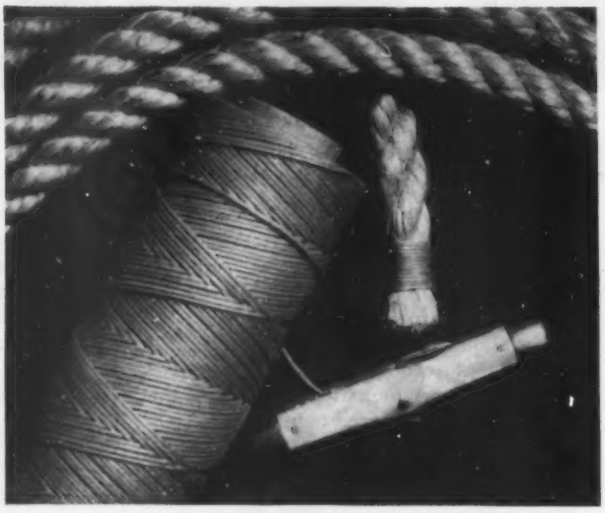
The thin line that boatmen like to use to separate the bottom paint from the topsides is called the boottopping. This band, usually an inch or so wide, is normally chosen in a contrasting color and of a hard enamel or anti-fouling type of paint. Striking in this band takes a careful hand and some boatmen rely on professional help for both boot-topping and bottom work.

This year, again, major strides have been made in anti-fouling bottom paints which the salt-water boatman would do well to investigate. Since copper or mercury poisons are the repelling agent in many of these paints, it is well to use a mask when old bottom paint is being removed and the new paint applied. Follow instructions carefully, as some paints will not hold on to a previous paint of different make and should have bare wood on which to anchor. While paint-remover and blow torch are useful, they must be employed with care. The beginner should wear rubber gloves when working with many removers in quantity, and should have previous practice before employing a blow torch on a wooden hull. Scorched wood planking and serious fires have been caused.

But after you have shopped carefully for your marine paint, (and do not overlook the excellent boat painting booklets offered in the ads of some paint companies), your result should be a more attractive and well protected boat than ever before to face the weather and waves of 1957.

—ELLISON MICHEL

The rope ends shown above reflect the results of a good whipping and no whipping at all. Properly done, whipping prevents a rope from unlaying and makes it easy to reeve through blocks and eyes.



All it takes to put on whipping is a penknife and some waxed sail twine; size shown above is good. Below is the American or Sailor's Whipping in which the ends are reef-knotted together prior to trimming.

basics of:

Rope Whipping

You owe your rope ends a good whipping; here are two easy-to-follow methods

By GORDON S. SMITH

Author member of Outdoor Photographers League

UNLESS the ends of a twisted rope are secured, they will unlay and soon become a tangle of loose strands. A frayed rope is not only cumbersome to handle but becomes progressively shorter as the unraveled ends lose their strength and break. To protect a line without tying a knot of some type in the end, it should be whipped.

The word "whipping" may have been handed down from old salts who checked the ends of every reef point to see if constant whipping against the sail was causing excessive wear. Sailmakers of those days used palm, needle, and serving mallet, but the methods shown here require only a penknife and waxed cord.

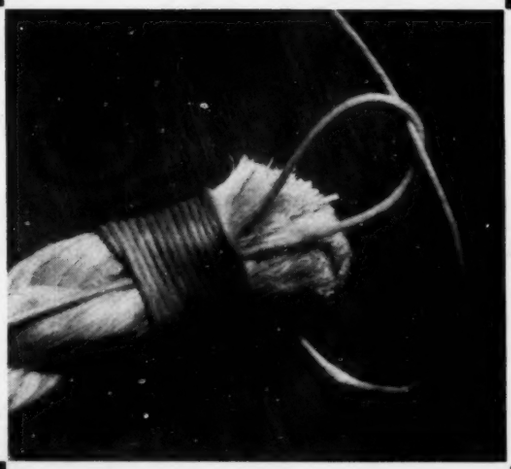
For emergencies, the end of a line may be bound with plastic electrician's or adhesive tape, or may be dipped in polyester resin. ◆

2

To proceed with your Common Whipping, keep on binding for a distance equal to diameter of rope, then thread through loop, as illustrated below.

1

In Common Whipping shown above, end of whipping cord is looped and bound tightly against lay. Binding commences about 1½" in diameter from the end of the rope.



3

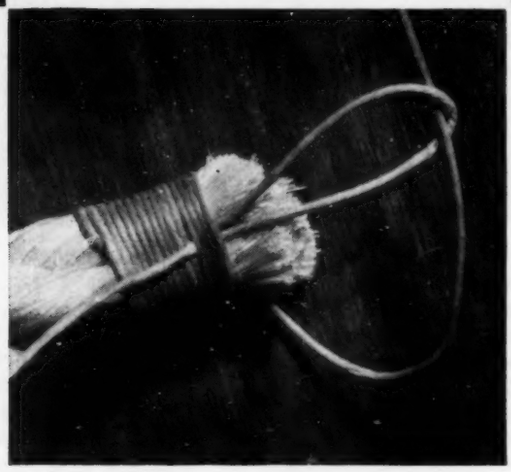
To complete Common Whipping, pull the loop back under the binding, as shown above, for about half of the distance, and trim off ends of twine.

2

Binding of Sailor's Whipping, which began 1½" in diameter from rope end, continues for about four more turns (below). Thread end through loop.

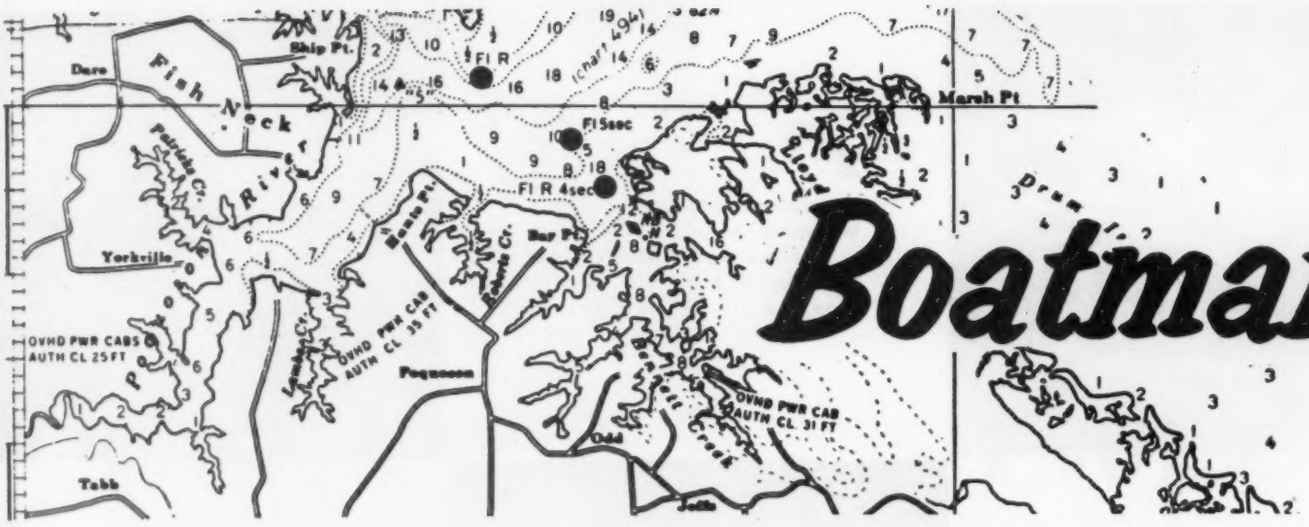
1

In Sailor's Whipping, above, binding is sometimes used to mark positions on lines. End of cord isn't looped but left straight, bound tightly.



3

To complete Sailor's Whipping, draw the loop up and pull all the way under the four turns; knot and trim with penknife, as is shown in picture above.

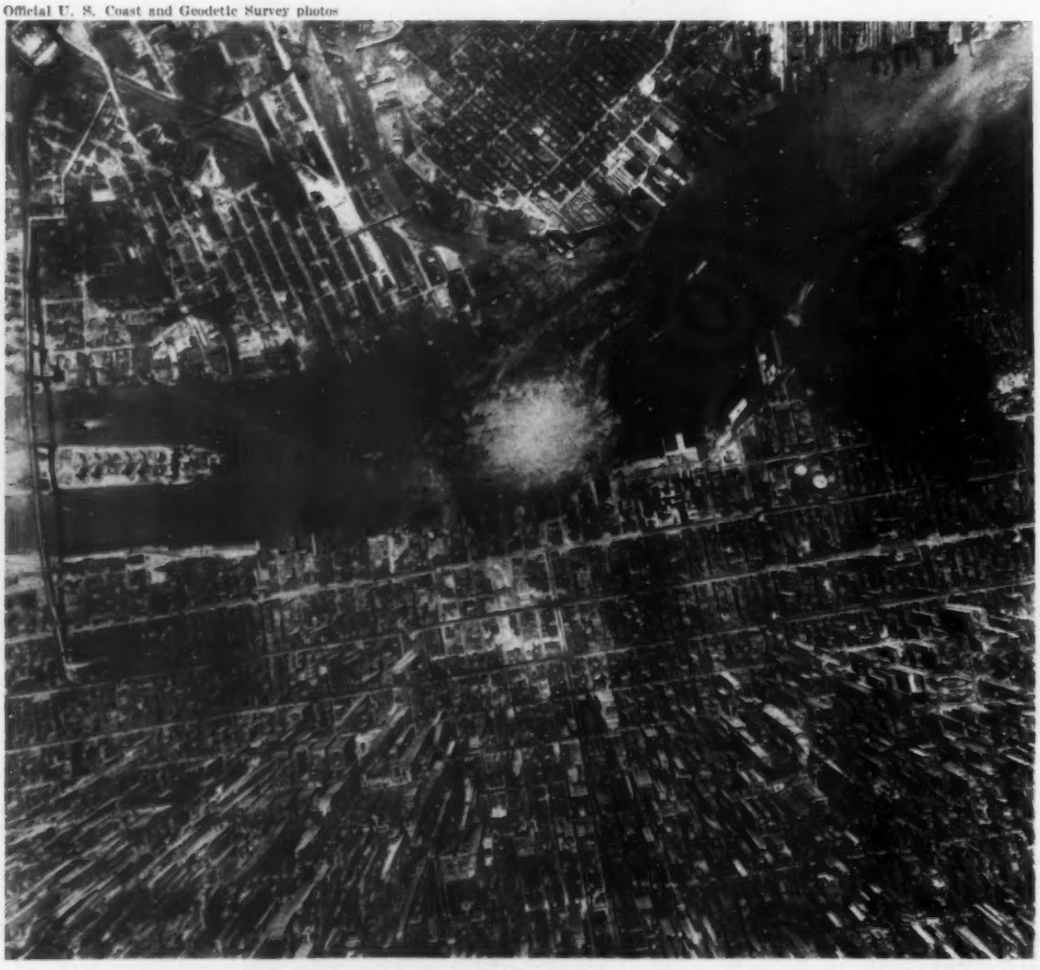


Boatmans

By HENRY LEE

Experienced boating writer and expert reporter

Official U. S. Coast and Geodetic Survey photos



THIS year, on its 150th anniversary, POPULAR BOATING salutes one of the oldest, smallest, least-publicized federal agencies which has, nonetheless, saved tens of thousands of seafaring lives and contributed immeasurably to scientific knowledge.

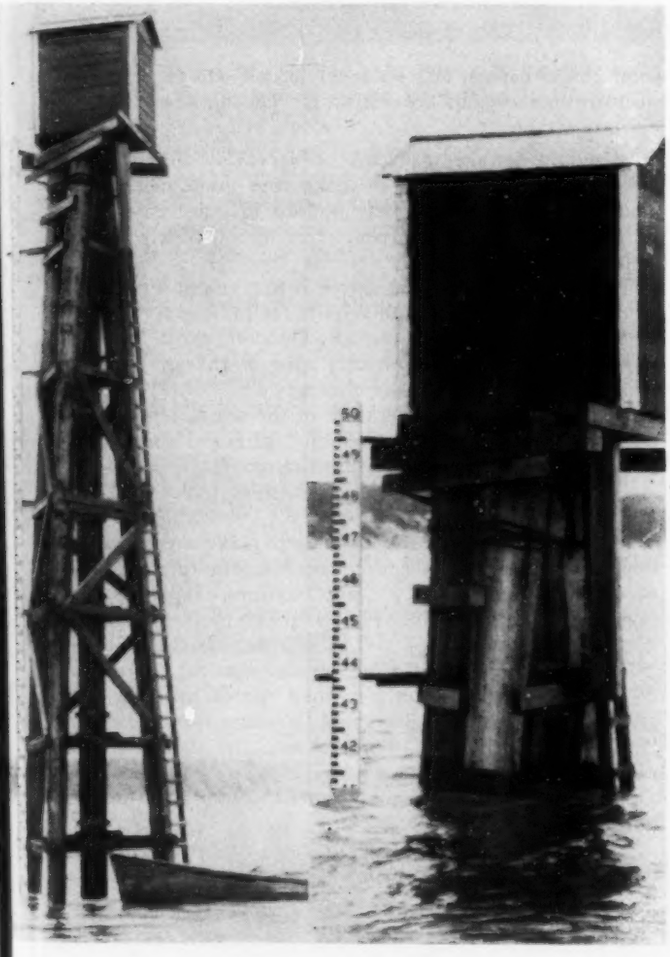
From the Navy and merchant marine to private boatmen, all mariners rely on the U.S. Coast and Geodetic Survey to warn them of reefs and shoals, brief them on the location of channels and navigational aids, describe for them the nature and form of the seacoasts, even the character of the sea bottoms many fathoms down.

Several governmental agencies do mapwork for specific purposes, but *only* Coast and Geodetic surveys and charts our waters under U.S. jurisdiction—and it is a prodigious hydrographic job. From Alaska to Hawaii, the Survey takes as its province all the shoreline of the U.S. and its possessions—some 100,000 miles, equivalent to four times round the world—and 2,116,000 square miles of water, reaching to the far sea edge of the continental shelf.

The fruits of its labor—some 900 current charts blending geodetic, topographic, hydrographic and cartographic knowledge and know-how—are distributed free to other

Right Hand Friend

A 150th anniversary salute to the U. S. Coast and Geodetic Survey, which charts U. S. waters



Up-to-the-minute methods are used to turn out the Survey's up-to-date charts for the mariner. At left is one of the aerial photos, taken with a specially designed nine-lens camera, which are used to help develop and correct charts. Tide stations, such as the one above, take measurements of ranges at given points. Note an approximate 40-foot variation between the high tide level and the low.

government agencies and sold at modest prices to individual boatmen and many industries.

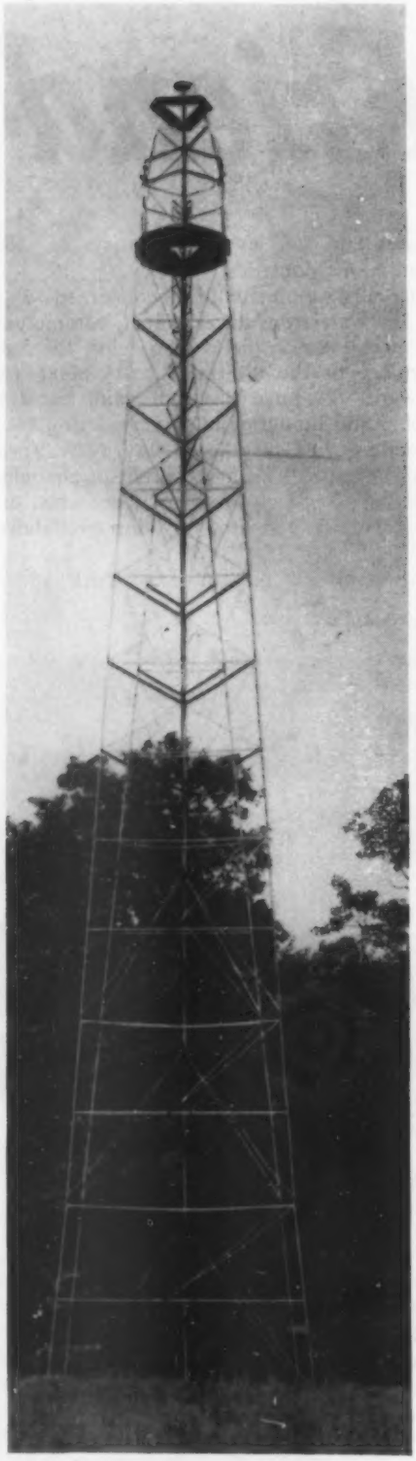
Engineering planners, municipalities concerned with erosion problems and waterfront development, commercial and private fishermen, even aesthetes who relish the fine, hand-engraved artistry of the old-time charts make use of the Survey's wares. A huge fireproof vault contains 15,000 hydrographic and topographic surveys dating back to the earliest soundings in Great South Bay, New York, in 1834. These hold invaluable historical proof of changing coastlines; and, being official government documents, are accepted by the courts in complicated litigation over shorefront properties.

Once, when the state and city of New York and a private company were involved in a hassle over Rockaway Point, the successive records kept by the Survey helped show that the Point's extension was due to normal accretion. In the famous California tidelands case, the U.S. Justice Department bolstered its briefs with records of high-water-line changes over many years.

The Pathfinder, a 2,000 ton member of the Survey's 15-vessel fleet, is used for extensive oceanographic investigation while preparing better charts for the boatman.

In its patient, ceaseless exploration of what lies under the water, the Survey is constantly discovering new submerged reefs, shoals, canyons and seamounts—some of them a delight to science, others a hair-raising danger to navigation. Once, in southeast Alaska, close to the steamer lane, the Survey found a shaft-like peak of rock which rose from 650 feet to within 17 feet of the surface.

Its studies also help the geologist, oceanographer and marine biologist and provide good basic material for bathymetric maps and sedimentation studies. As a matter of fact, since the Survey does its job by land and air as well as sea, its services go much farther than that. If you are



The Survey's enormous strides in operation include the use of portable, demountable Bilby steel towers in its triangulation work. From the top, the surveyor can take sightings which will augment the topographic data now available for almost every part of the country.

Accurate water charts depend on data involving elevations; these are carefully preserved by brass discs or "bench marks."

involved in sewage problems or surveying the land you live on, if you fly a plane or make your home in an earthquake area, if you have any interest in tides, currents or magnetism, Coast and Geodetic is unobtrusively helping you out!

While the Survey's primary job is to turn out a profusion of detailed, up-to-the-minute charts for mariners, the motto in Washington seems to be, "Let Geodetic do it." And so this amazingly versatile agency also is charged with responsibility for these other chores:

. . . To take the temperature of the sea water and note its density at various tide stations, gather oceanographic data on currents and take bottom samplings.

. . . To maintain tide tables, current tables and tidal current charts.

. . . To investigate and map earthquake areas through operation of 28 Survey and cooperating stations and study of data received from 153 other stations. In a year, the Survey receives more than 8,500 'quake messages and announces the locations of 500 to 600 disturbances.

. . . To compile and print the aeronautical charts used by civil aviation, not only in their flights over the U.S. and its possessions but also along the international airways. Almost 1,000 different flying charts, the data on them ranging from prominent landmarks to obstructions near major airports, are available, and their sale runs into the millions of copies yearly.

. . . To study any changes in the earth's magnetism, a huge project which has involved observations in almost all the 3,000 county seats through the country, plus repeat observations in 150 selected stations and continuous photographic records in magnetic laboratories.

. . . To cooperate in an international variation-of-latitude study by continuous operation of two observatories in Ukiah, Calif., and Gaithersburg, Md. Three other such observatories are spaced around the world in the same parallel of latitude to detect movements of the earth's axis of rotation.

Oh yes, and in its spare time, the Survey computes tables of distances between some 10,000 ports of the U.S. and outlying territories along the shortest routes marked by aids to navigation, along with a timetable for the various distances at varying speeds!

Perhaps, as a boatman, you are thinking a bit impa-

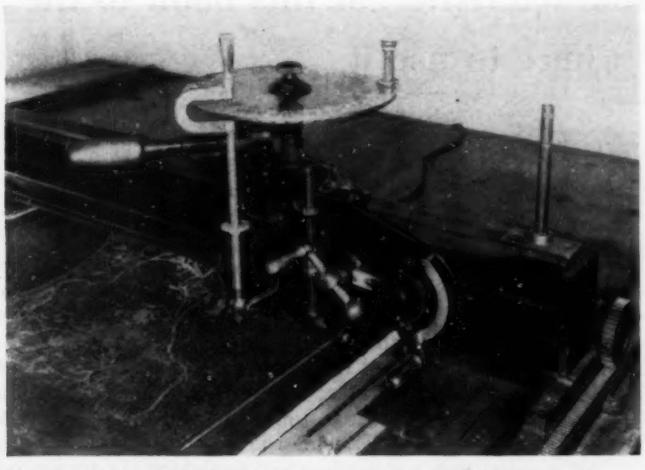
In 380,000 miles of levelling, a process used to determine difference in elevation between two points on the surface of the earth, the Survey has deposited more than 275,000 bench mark discs in strategic spots such as this mountain peak.

tiently, the Survey ought to get its feet wetter and spend less time on dry-land astronomic, gravital and magnetic observations. Inescapably, however, finely accurate water charts depend on such data, including the second adjective in the Survey's name—*geodetic*. The geoid is the curvature of the sea level surface of the earth, and geodetic surveys are those vastly important basic observations which consider the size and shape of the earth.

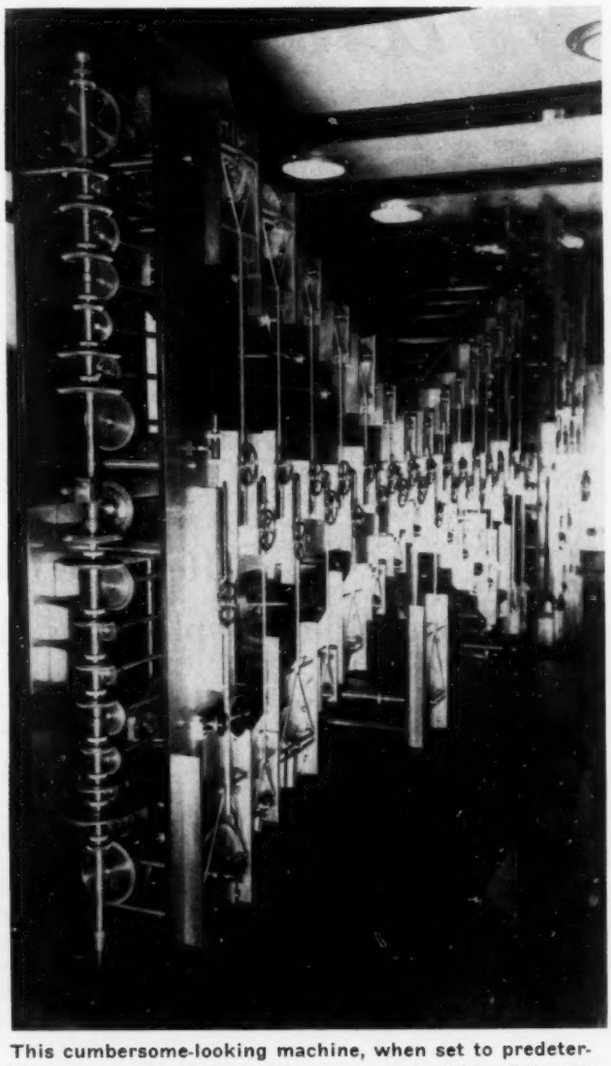
To draft charts which the mariner can safely rely on, the Survey must make a running start from the land. This involves both *horizontal* and *vertical* controls. The former is achieved by triangulation, an efficient method of surveying great areas which measures all the angles in a great link of connected triangles. It dispenses with the costly, tedious job of measuring every line in the survey. *Vertical* control involves levelling to ascertain the difference in elevation between any two points on the surface of the earth.

Thanks to a stubborn, Swiss-born scientist who became the Survey's first superintendent, the United States today

(*continued on page* 61)

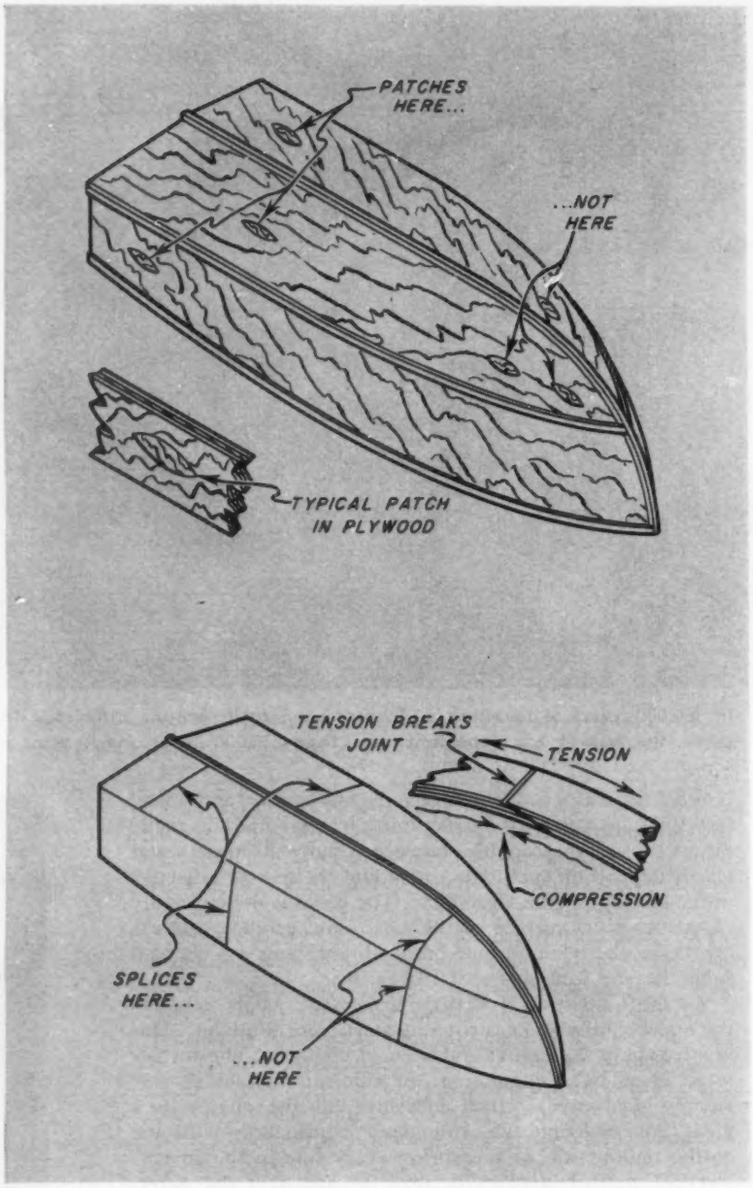


Coast and Geodetic has had to invent its own instruments. This intricate device is used to engrave sounding measurements on plates from which nautical charts are produced.



This cumbersome-looking machine, when set to predetermined constants, will give the times and heights of the tides for any part of the world and for any year and day.

How To Work With Plywood



Examine your plywood panel for patches and splices. They will not weaken the construction if placed in level areas as shown above, or turned toward the inside of the planking.

Here are the characteristics of this boon to the kit boat builder—plus how and where to use it

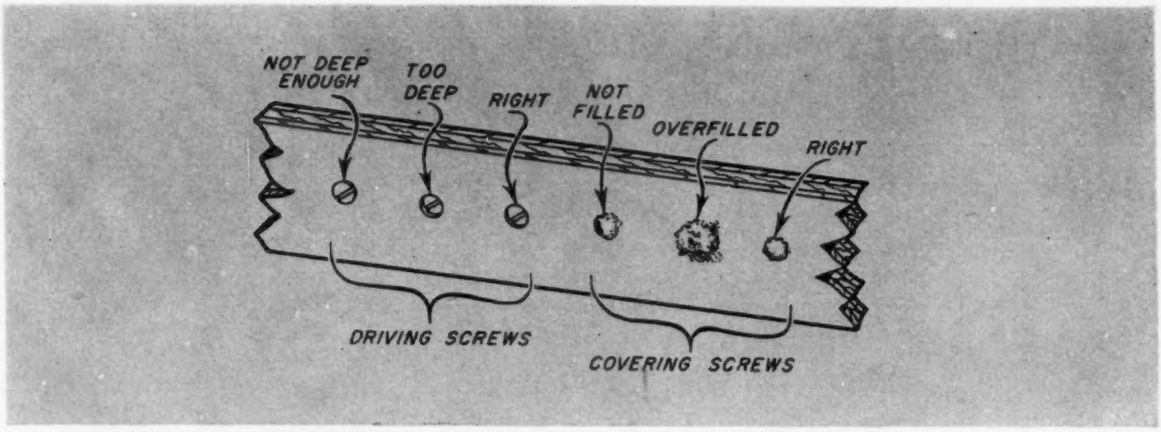
By BOB WHITTIER
Associate, Society of Small Craft Designers

FOR today's amateur boat builder, plywood offers a number of major advantages. Planking is now possible with speed and ease compared with a number of years ago, and caulking of innumerable seams is no longer necessary. Plywood, like all materials however, works best when the boatman has a knowledge of its special qualities, advantages, and limitations. The pointers and hints which follow are based on the author's first hand experience in building many small boats. Kit construction is discussed to show the problems most likely to arise, and the answers you will want to know.

If your kit is the product of one of the better-known firms, or of an obscure firm with a keen desire to build up a good reputation, you can be sure that a lot of time and work has gone into working out the shapes of all the parts so they will fit together accurately.

You may have read that sheet plywood cannot be bent into a compound curvature . . . which is indeed true. But when you open your kit you may be puzzled and surprised to see that the bottom frames have a peculiar bulge. But before you grab a jack plane and straighten the frames out so they look right, wait a minute!

Take a piece of Bristol board about 8″x10″ and hold it flat between your hands. Then give it a moderate amount



Screws should be driven deep enough so that they will not show through the final paint finish and the holes may be filled. Screws countersunk too deeply go below the top ply and hold less firmly.

of twist. See that curvature it takes as it bends? It it were a sheet of plywood being bent onto a boat's bottom, it would go onto those curved frames perfectly. Designing the frame of a plywood boat is not a simple matter. It requires specialized knowledge of the geometry of "developable surfaces." You don't make a frame that looks good and then force the plywood onto it; you figure out beforehand how the plywood will want to bend, and design a frame to fit inside it. This is just one of a thousand reasons why only a trained naval architect can design a boat that really *is* good, aside from just *looking* good. Don't fool around with the shapes of the frames in your kit!

The several frames in your kit, along with the stem and transom, are really forms or molds which form the hull into the shape the designer wanted it to have in order to perform well. When construction begins, they must be set up accurately and be held rigidly so they will not shift out of position as you bend stringers on, drive screws in and smooth things up with a plane. A jig of some kind must be made for this purpose. Some kits are designed so that the packing crate serves as a ready-made jig. Others require construction of a jig from rough lumber, while a few are made in such a way that the frames may be temporarily fastened to a wooden floor, which makes a level, rigid working base. If your kit's jigging method impresses you as being flexible or insecure, beef it up with scrap lumber using common sense as a guide.

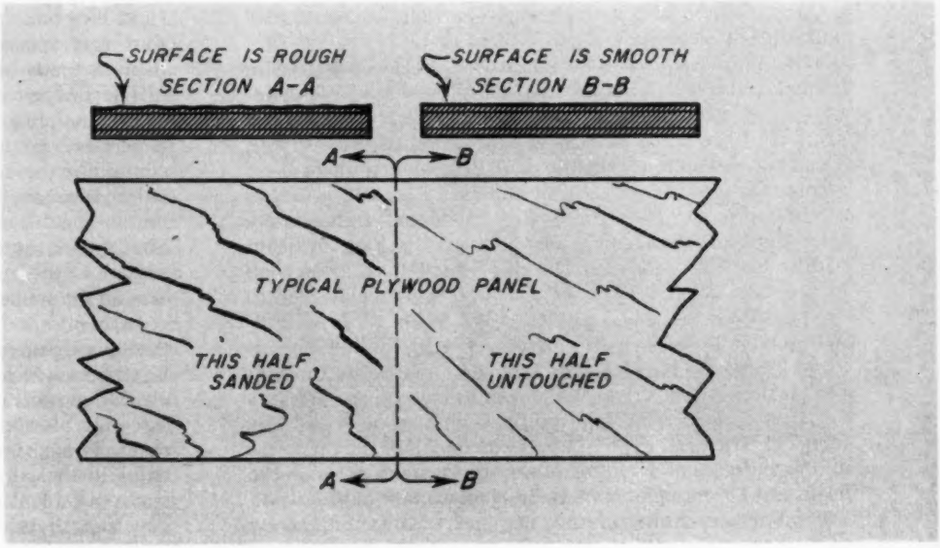
When the frames are in place on the jig, it will pay off handsomely to stop work for a while and go over the framing with a level, chalk line, plumb bob and carpenter's square to make sure that all frames are perfectly positioned. If just one frame is off center, higher on one side than on the other, or not at right angles to the center line, it will throw the entire hull out of shape. It will show up after the longitudinal strips are in place and be a chore to correct. If you don't catch it then and put the plywood on, you'll be stuck with a permanent reminder of your hastiness.

While assembling the framework bear in mind that many of the sawn rectangular parts will later be bevelled on their outer sides to let the plywood lay tight and snug against the frame. Set screw heads deep enough so they won't ruin the blade of your plane during the bevelling process. While planing, have a yardstick handy to string onto the frame at frequent intervals. It simulates the plywood planking and helps trim down the frame so that the plywood will lay against it with a very minimum of gaps and narrow edges. The watertightness and rigidity of your hull depends largely on a snug seam between frame and planking.

In the majority of kits plywood is attached with wood screws plus glue or seam compound. Some people suggest the use of nails, particularly the types having a multitude of grooves or ridges in their shanks which grip wood fibers and make them hold far better than smooth nails.

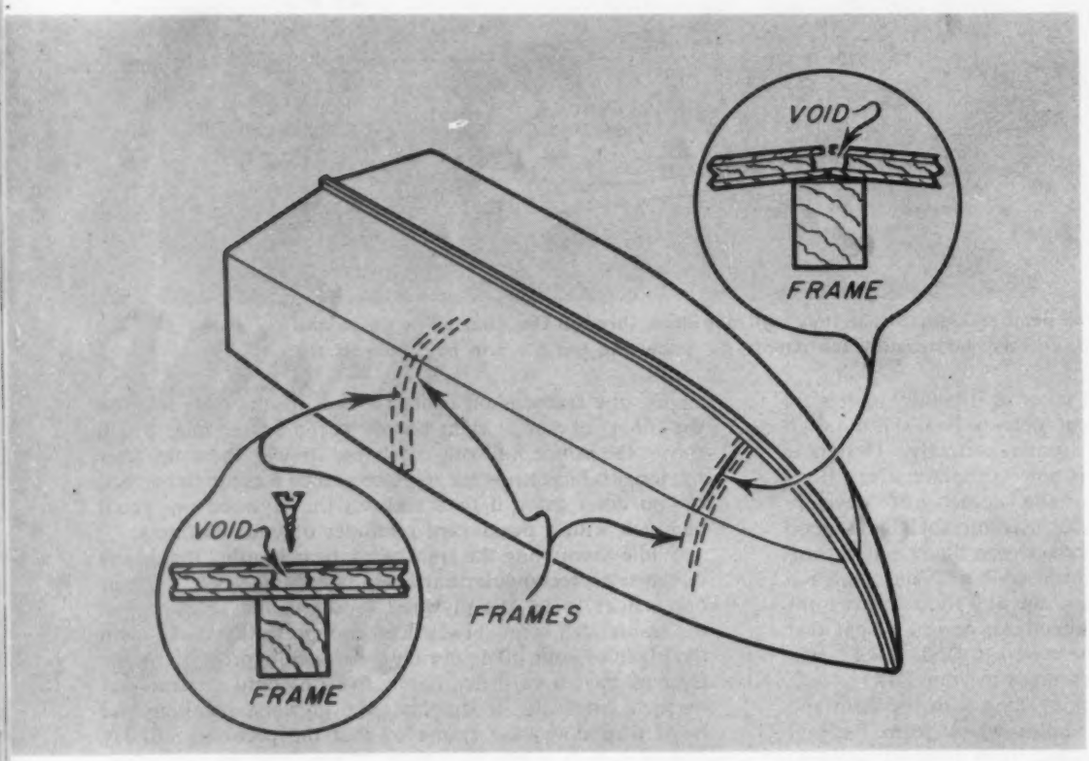
When screws are used it is possible to attach the plywood temporarily without using any glue. The fit between plywood and frame can be inspected, and the plywood quickly removed so that high spots can be planed off or depressions filled with glued shims. Then glue is applied to the frame and the plywood can be screwed on again permanently. You can't do this with threaded nails, and for the amateur it may be a disadvantage.

Newcomers sometimes have doubts about the correct



Sanding fir plywood must be done with care. When first received from your lumber yard, it is smooth (B-B) as finished by the manufacturer. Additional hand sanding tends to gouge out the softer sections between grain ridges. Filled screw holes should be leveled but additional sanding delayed until after filler coats have been applied.

Bending plywood is possible if properly handled



A void or gap in the inner layer can cause weakness if it is bent over a frame or is struck by a screw. For this reason exterior waterproof plywood in a "boat hull" or "marine" grade should be chosen for boat building. These are more carefully made, to avoid small flaws. Voids which show on the edges may be probed for depth and filled with splinters dipped in waterproof glue.

size of screws to use and how to space them. Don't worry about this. There are no hard-and-fast rules. Just use common sense. If you want to attach quarter-inch plywood to a batten three-quarters of an inch thick, one-inch screws are too likely to have their points come out the other side, so the logical choice is three-quarter inch screws. As to the thickness of screw shanks, you obviously want heads large enough to bear up well in the wood and minimize chances of pulling through. You merely choose screws whose heads look suitable for the job. On outboard boats in the 8- to 16-foot category, No. 8 screws will work nicely. As to spacing, they should be close enough to pull the plywood against the frame snugly. If they were to be spaced eight inches apart on quarter-inch plywood, there is a chance that the plywood will hump up between them. In general, a spacing of three or four inches will be found to work well and still not consume too many screws.

Drill pilot holes with one of those gadgets you see in hardware stores that makes a correctly-sized hole and countersinks at the same time. With one of these in an electric drill, you can make pilot holes and shoot screws in with a ratchet screwdriver rapidly and dependably. Don't use a common screwdriver . . . it will take ages and give you a blistered palm before the boat is half done. Immediately after finishing a fastening job, go over the joint or seam with a wet rag and wipe off glue which may have been forced out. If you let it dry, it will be much harder to scrape off later.

If screws are driven in only far enough for their heads to be flush with the wood surface, they will show through paint. If they are driven too deeply they will go past the outer lamination of the plywood and holding power will be reduced. The ideal depth is approximately half the thickness of the outer ply. Holding power is satisfactory, and the heads are far enough below the surface so that plastic wood will hide them well and stay in place. Moistening screw heads with plastic wood solvent helps to bind the material to the screw head and is effective in curing any tendency for it to fall out.

Most kit boats are designed with gentle curves so amateurs can bend wood into place with little trouble and no danger of cracking something. If plywood seems to be going on hard, or gives off ominous snapping sounds, wet it with hot water and prop it half-way on. Let it stand overnight. This gives it a set and lets the wood go the rest of the way more easily.

All plywood is based on a basic dimension of four feet by eight feet. The machinery in plywood mills is built to handle this standard dimension. If we want panels over eight feet long for a boat, splicing must be resorted to. A ten-foot panel is made by splicing a two-foot section to an eight foot panel. A twelve-foot panel is made by splicing a four foot section to an eight foot panel. A sixteen foot panel is made of two eight foot panels.

The factory splice is made quickly and accurately with special splicing machinery and, with few exceptions, is dependable and durable. It is recommended that panels containing these splices be installed on hulls with the splices either amidships or towards the stern, where there is a minimum of curvature. If a splice is installed towards the bow, where there is considerably more curvature, the outer surface of the plywood is placed under tension. The tension acts on the splice and can in time make it come apart.

In a plywood factory, one man feeds strips of veneer through a glue spreader. The next man takes them out and lays them side by side on top of a four foot by eight foot piece of veneer. These strips form the core of a piece of three-ply plywood. The third stands ready to lay the other outer ply over the core plies. As you can readily grasp, these strips in the core may not always be 100% straight, they may not be laid down so they all lie edge-to-edge, and they may slip slightly from handling and pressure. Thus it is

In a plywood factory the man above left is feeding strips of veneer through a glue spreader. Worker at right pulls them out and lays them on bottom ply to form center core. Man at bottom stands ready to lay on top outer layer over core plys.

that we often find *voids* in the cores of plywood. If screws happen to go through a void, holding power will be reduced. If rainwater seeps inside, rot can take place. If the panel is bent too much it may crack at the void. This is bad in boatbuilding, so some plywood firms manufacture exterior waterproof plywood in what is variously called "Boat Hull" or "Marine" grade. More care is taken to eliminate voids. While they are encountered now and then, as a rule they are not common enough to cause any trouble.

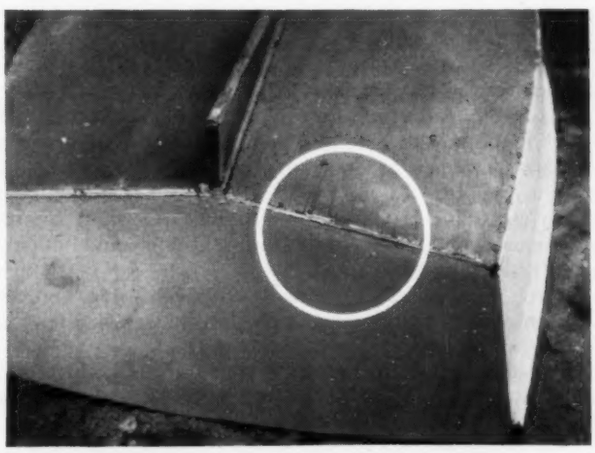
Look at your plywood. If it has voids in it, do two things. First, if at all possible avoid putting it on the hull with the voids towards the bow sections. Second, probe the voids with thin wire to see how deep they are. Saw and plane some slivers of wood which will fit into the voids. Run thin glue into the voids and push the slivers in to fill the voids with solid wood. You should then have no trouble at all.

Also, carefully inspect all surfaces of your plywood for eye patches. They are quite common and are put in the plywood to repair knot holes, pitch pockets, etc. If this were not done, a large amount of wood with only a few small defects would have to be rejected and the cost of patch-free plywood would be much higher. If these patches occur in the plywood towards the bow, particularly on bottom panels having some twist in them, the ends of the patches tend to crack and in time the whole patch may work itself loose. Try to apply your panels with these patches either on the inner side or towards the stern. If your kit has pre-cut side and bottom pieces and you find an eye patch in the bow sections, about all you can do is bend the plywood on slowly and carefully to avoid overstressing the patches. The problem of coping with these patches in large-scale boat production is one reason why some outboard boat factories have been adopting mahogany-type plywoods, which do not have eye patches.

Kits usually contain full-length plywood panels since kit producers buy large quantities and it is easy to get what they want. Besides, it facilitates production to saw out full-length side and bottom pieces instead of fussing with several sections. Now and then, however, men who are building their boats from plans, using locally purchased materials, discover that their plans call for making splices in the plywood by means of butt blocks. When such splices are called for, they are detailed on the plans. Since kit advertising often highlights the fact that "full-length panels are included; no splices to make!", some amateurs develop apprehension over the use of butt-block splices. They are, however, simple to make and reliable.

Usually the details on plans show these splices using wood screws to attach the plywood to the butt blocks.

(*continued on page* 60)



Plywood edges should receive protection for best wear. Delamination in circled area could be prevented by ½x1" oak strip screwed along edge.

BUILD AN 11-FOOT OUTBOARD

This small and sturdy craft can make a fine family project

Designed by EDWIN MONK, Naval Architect

When the stem has a bevel of varying width, a thin batten must be sprung to the proper distance from edge; use twin row of brads or nails to hold batten firmly in place, then strike in the bevel line with pencil or other marker. Here builder uses plywood panel as a layout board and work bench.

In the photo below builder is fastening last frame in place on building jig. Frames should be checked for both alignment and plumb as they are mounted. Strips of scrap wood are tacked across the frames and transom to temporarily brace the structure. This completed it's time to tackle stem assembly.

Above is a transom and close-up of the jig or sawhorse on which the boat is built. The notch visible on far side is for seat riser; center notch is for the keelson, and the others are for battens. It's simplest to rough these out prior to mounting the frames on the two set-up stringers.

THIS FINE little outboard for all around fun is easy to make and versatile to use. It is a fishing, family, and sports boat that can be carried by car-top and pushed along by a five or ten horsepower motor. It was designed by naval architect Edwin Monk with home builders in mind. Enlarged plans are available from lumber yards selling plywood, and from the Douglas Fir Plywood Association, Tacoma 2, Washington.

Before you begin work, study the plan until the details of each step in construction are clear in your mind.

Making a full-sized drawing of each frame simplifies building the skeleton of your boat. You can use one of the fir plywood panels ordered for planking as a layout board, with a long edge of the panel serving as a baseline. Lay out a centerline at right angles to this edge with a large steel square, and plot the water line, set-up line and buttocks as shown in the plan.

If you number each drawing to avoid confusion, you can superimpose all frame layouts on this one set of reference lines.

To establish the curved lines in your frame drawings, tack brads at dimension points. Then bend a ⅜"-square batten around the brads and draw the curve along the batten.

Next transfer your layouts to the frame lumber. Simply lay hardwood over the drawing of each frame and re-draw the straight lines. One way to transfer curves is to set tacks or nails with heads along the layout line. Pressing the lumber down against the nail heads will leave marks in the wood, and you can connect these marks, using the batten again, to reproduce the curve.

All the frames are symmetrical. When you've cut one side member for a frame to shape, turn it over and use it as a pattern for the other side.

Line up the parts for each frame in turn directly over the corresponding layout. Tack the chine gussets in place temporarily and drill screw holes, countersinking for the heads. Then remove the gussets, spread all joining surfaces with waterproof glue and screw the frame together permanently.

Fasten a crossband to each frame with its top edge at the set-up line. Mark the centerline and the position of the set-up stringers on all the crossbands.

The marked side of each frame is called the "molded face." In the construction drawing this molded face faces aft. Bevel the frame edges to or from the molded face with a jack plane, taking the approximate angle from the plan with a small carpenter's bevel.

Before assembling the transom frame to the plywood transom panel, rough out the notches in this frame for the battens. Note that these notches are cut in the frame only—not in the plywood transom.

You can lay out the stem and forefoot directly on the hardwood. When you've cut these pieces to shape, lay them flat on your bench, measuring along line A, shown in the

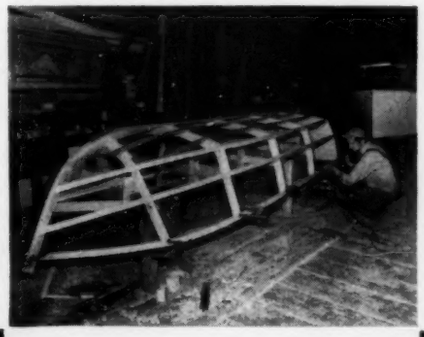
plan, to point B. Correct the joint if necessary, cut cheek pieces and assemble the stem with screws and glue. When the glue has set, bevel the stem and forefoot with a drawknife or plane. Mark the sheer line on the stem and the position of frame No. 1 on the forefoot.

Mount the two set-up stringers, which may be 2 x 4's, 2 x 6's or 4 x 4's, across sawhorses or solid crosspieces fastened securely to the floor. Saw off the after ends of the stringers at an angle for the transom, and lay out frame locations on them with a square, nailing cleats to these marks. The forward ends of the stringers should be cut off close to frame No. 1 to allow clearance for the side planks.

It's easiest to rough out notches in the frames for the keel, sheer and chine battens, and on frame No. 1 for the forefoot, before mounting the frames on the stringers.

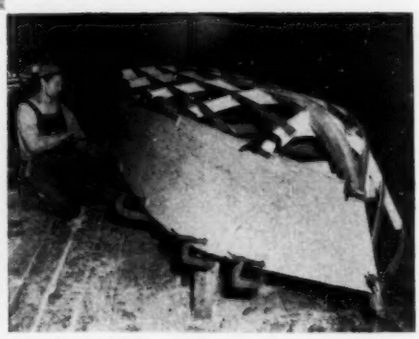
This jaunty plywood performer has generous freeboard.

Visible below is the stem, forefoot and stem positioning piece. Keelson has been tacked in place for trial fit; the chines, which were planed to a taper, are also in place, as is the seat riser on far side. Clamps are used to hold the battens in position while the builder miters the forward ends to butt snugly against the stem.



Side and bottom plank patterns can be made by laying building paper over boat frame and drawing around the battens, transom and stem. First fit side planks, roughing them to shape and then clamping them into position, as shown below, for trimming. The wood pieces prevent the clamps from denting the actual planks.

Above builder checks line-up of a sheer stringer after securing it with clamps. Keelson, faired into forefoot and stem assembly, is now in place; bottom battens are also in place. These strips require very little fairing if they're fitted carefully. Positioning of bottom battens isn't critical and need not be exact.



Nail the transom panel to the end cleats, aligning the set-up line on the panel with the tops of the stringers. Nailing through small blocks of scrap wood will make it easy to pull the nails later.

Then set up the frames, fastening the crossbands to the stringer cleats. Check the frames for alignment and for plumb as you mount them. When they're all in position, tack or clamp strips of scrap wood across the frames and transom to brace the structure temporarily.

Next try the stem assembly, which notches into frame No. 1, in place. To brace the stem, nail a 1 x 4 to the crossbands on frames Nos. 1 and 2, centering it, and notch this positioning piece for the stem exactly 15½" from frame No. 1. Also brace the end of the stem to the floor.

This done, you can fit the keel batten to the forefoot, frames and transom. Mortise the after end of this batten into the blind notch in the transom frame. Glue and screw it in place permanently, countersinking the screw heads deeply.

Now correct the bevels on the stem and forefoot. Bending a batten or strip of plywood across the frames and stem shows you the proper angle for these bevels.

The chine battens are planed to a taper. Trim out the notches for these battens in each frame, sighting along your saw at the notch in an adjoining frame, and try them in place. Holding them with C-clamps, miter the forward ends to butt against the stem.

Fair up the framework before fitting seat risers, sheer and bottom battens. Bending a strip of plywood across the frames will indicate which ones need planing. Work carefully, removing high spots and re-beveling the edges until you're sure the plywood planks will lay up tightly. Try to avoid rounding off the frame edges—keep the bevels flat.

Also plane off the keel and chine battens to fair with the frames.

Now cut notches in the frames for the seat risers and bottom battens. These strips will require little fairing if you fit them carefully. The positioning of the bottom battens is not critical.

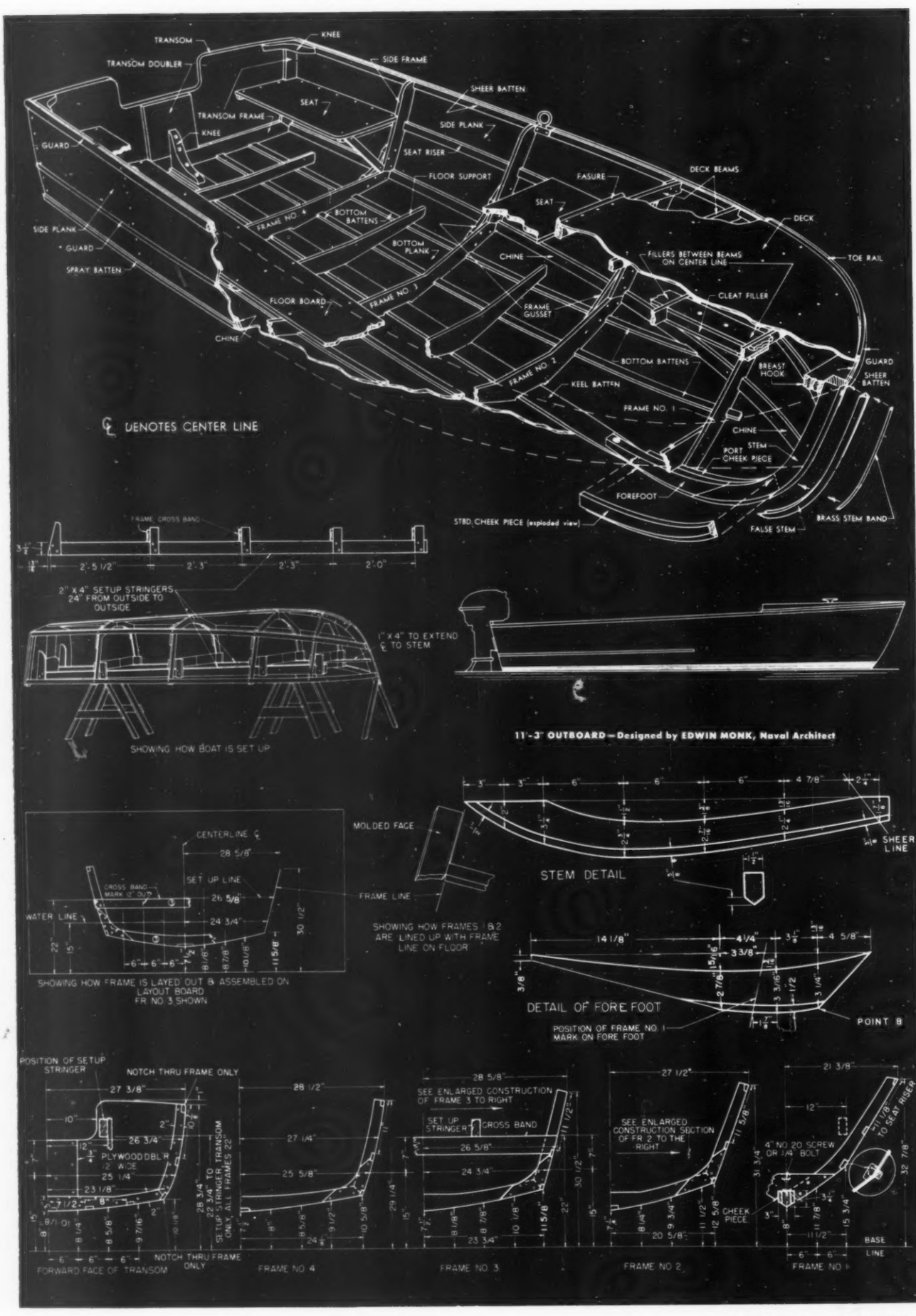
You can cut one side plank and one bottom plank for each 4′ x 12′ fir plywood panel. To make patterns for these planks, lay building paper over your boat frame and draw around the stem, battens and transom.

Fit the side planks first, roughing them to shape and clamping them in place for trimming.

The bottom planks overlap the edges of the side planks from the transom to frame No. 1. From frame No. 1 to the stem, where the angle between the planks flattens, the plywood butts edge-to-edge. For this reason the side planks are planed flush with the chine batten from frame No. 1 aft. From frame No. 1 forward they are trimmed to the centerline of the batten.

Coat stem, battens, frames and transom liberally with waterproof glue when you fasten the planks, and lay in a

THESE PLANS SHOW A FAMILY OUTBOARD



11'-3" OUTBOARD — Designed by EDWIN MONK, Naval Architect

SHOWING HOW FRAME IS LAYED OUT & ASSEMBLED ON LAYOUT BOARD FR NO 3 SHOWN

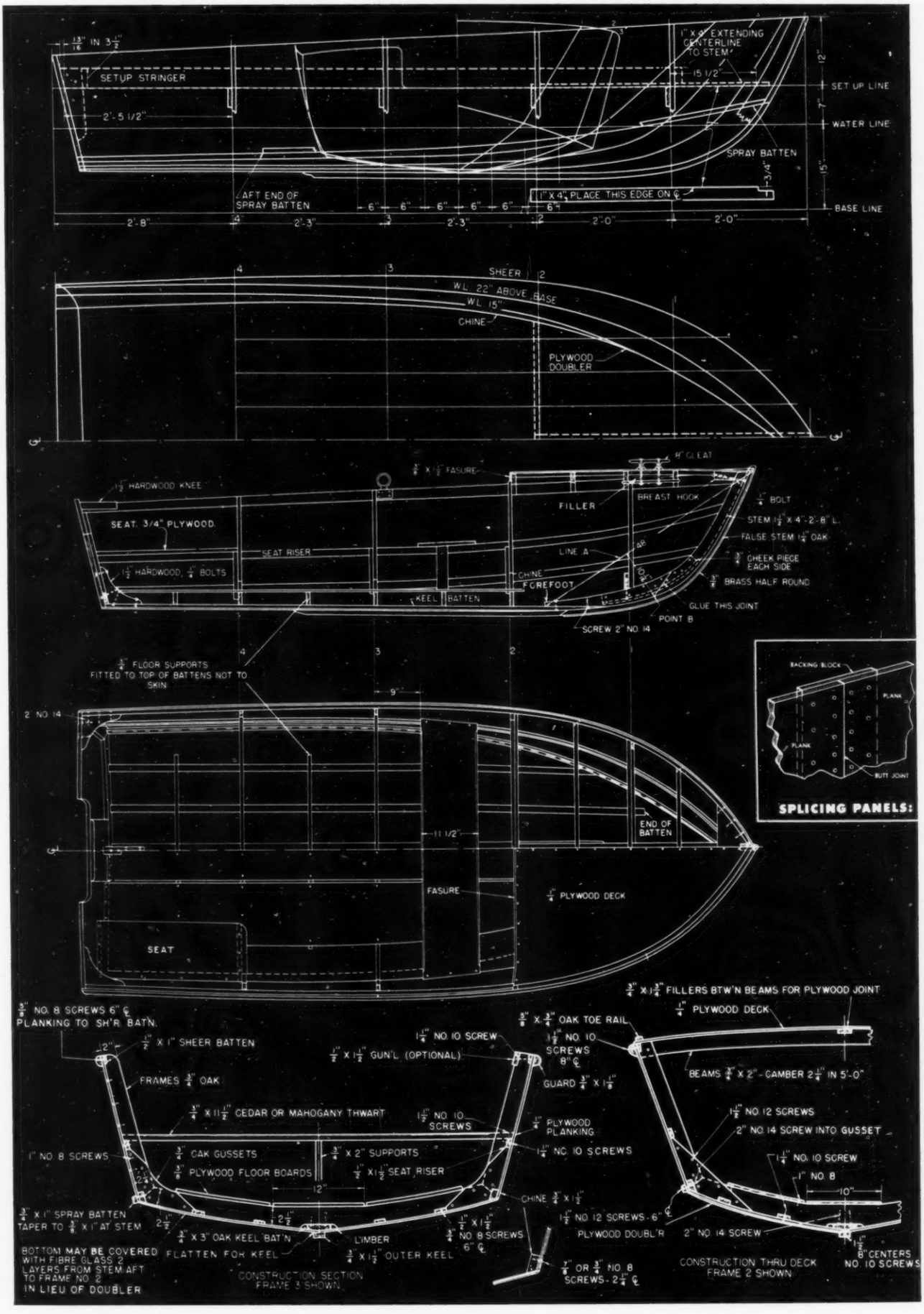
SHOWING HOW FRAMES 1 & 2 ARE LINED UP WITH FRAME LINE ON FLOOR

STEM DETAIL

DETAIL OF FORE FOOT

POSITION OF FRAME NO. 1 MARK ON FORE FOOT

ESPECIALLY DESIGNED FOR HOME BUILDING



glue-soaked thread of candlewicking along the stem and transom joints for added leak insurance. Begin fastening the planks at the stem and work back, spacing screws every 3" along the frames and battens. Countersink the screw heads slightly below the surface of the plywood. They can be smoothed off with surfacing compound later.

If you fasten the planks with patented bronze or monel nails, space them as the manufacturer recommends.

When you've planked your boat, plane a flat surface for the keel and fill the planking joint with seam compound. Also trim the ends of the side planks at the stem for the false stem, which can either be steam-bent or built up from laminated hardwood strips.

Now install the ¼" plywood doubler on the bottom planks. Fit the halves of the doubler to the keel and chines and set them in waterproof glue or double-planking cement, nailing or screwing through the bottom planks into the battens. If you wish you can substitute a double layer of resin-impregnated glass cloth for this doubler.

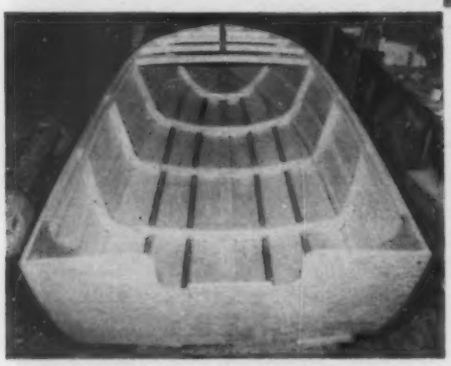
As soon as you've fitted the spray battens covering the planking joints along the chines, you're ready to turn your hull right-side-up and remove the stringers.

The plan shows construction details for the deck beams and deck, seats, floor supports, removable floorboards and finishing trim. Add cleats and fittings to suit.

Be sure to prime the plywood well and seal all edges—exposed or not—with a good marine primer. Use high quality marine paint for undercoat and finish coats to complete your boat. Careful construction will reward you with a boat that can afford many seasons of water fun. ◆

After spray battens covering the planking joints along the chines have been fitted, the hull can be turned right side up and builder can remove the stringers. Inside framing and the deck frames are visible in view from astern shown below.

It is wise to use a good paintable resin-base water repellent before applying the prime coat. In picture below the builder demonstrates the proper method of brushing on marine primer. Putty and elastic seam compound should be used on seams and nail holes.



Pictured above is hull fitted with deck, floor supports, removable floorboards, seat and finishing trim. Note how amidships seat rests on seat riser to which it is fastened. Builder can add cleats and fittings; these are up to the individual.

BILL OF MATERIALS

ITEM	NO. PCS.	NET SIZE	LENGTH	KIND
Transom	1	¾" x 24"	4'9"	EXT-A-A grade Fir Plywood
Planking	2	¼" x 48"	12'	EXT-A-A grade Fir Plywood
Planking Doubler and Forward Deck	1	¼" x 48"	8'	EXT-A-C grade Fir Plywood
Floor Boards	1	⅜" x 48"	8'	EXT-A-C grade Fir Plywood
Midship Seat	1	¾" x 11½"	4½'	EXT-A-C grade Fir Plywood
Aft Seats	1	¾" x 11½"	5'	EXT-A-C grade Fir Plywood
Transom Doubler	1	¾" x 12"	12"	EXT-A-C grade Fir Plywood
Stem	1	1½" x 4"	2'8"	Oak or Mahogany
Forefoot	1	1½" x 4½"	2'2"	Oak or Mahogany
Keel Batten	1	¾" x 3"	8'4"	Oak or Mahogany
Outer Keel	1	¾" x 1½"	7'9"	Oak
Chines	2	¾" x 1½"	11'6"	Oak
Sheer Battens	2	¾" x 1½"	12'	Oak
Gunwale (if used)	2	½" x 1½"	12'	Oak
Seat Risers	2	½" x 1½"	12'	Oak
Spray Battens	2	¾" x 1"	8'	Oak
Guards	2	¾" x 1⅛"	12'	Oak
Transom Knees (3)	1	1½" x 6"	3'	Mahogany or Oak
Breast Hook	1	15⅝" x 5½"	1½'	Mahogany or Fir
Stem Check Pieces	1	¾" x 4"	3'6"	Mahogany or Oak
False Stem	1	1¼" x 3"	4'6"	Oak

ITEM	NO. PCS.	NET SIZE	LENGTH	KIND
Deck Beams	2	¾" x 6½"	4'6"	Fir or Mahogany
Toe Rail	2	⅝" x ¾"	5'	Oak
Filler for Cleat	1	1¼" x 1¾"	9"	Fir
Frame No. 1 Sides	2	¾" x 6"	3'	Oak
Frame No. 1 Floor Timber	1	¾" x 4"	2'	Oak
Frame No. 2 Sides	1	¾" x 2½"	5'	Oak
Frame No. 2 Bottom	1	¾" x 7"	3½'	Oak
Frame No. 3 Sides	1	¾" x 2"	3½'	Oak
Frame No. 3 Bottom	1	¾" x 6"	4'	Oak
Frame No. 4 Sides	1	¾" x 3"	3½'	Oak
Frame No. 4 Bottom	1	¾" x 5"	4'	Oak
Transom Side Frame	1	¾" x 3"	3½'	Oak
Transom Bottom Frame	1	¾" x 4½"	4'	Oak
Crame Gussets	1	¾" x 6"	5'	Oak
Aux Tary Floor Timbers	3	¾" x 6"	4'	Fir, Mahogany, Oak
Bottom Battens	4	½" x 1½"	10'	Oak or Mahogany
Beam Fasure	1	⅜" x 4"	5'	Mahogany

SET-UP MATERIAL

Set-up Stringers	2	2" x 4"	10'	Fir or Pine
Cross Bands	2	1" x 4"	10'	Fir or Pine

FASTENINGS

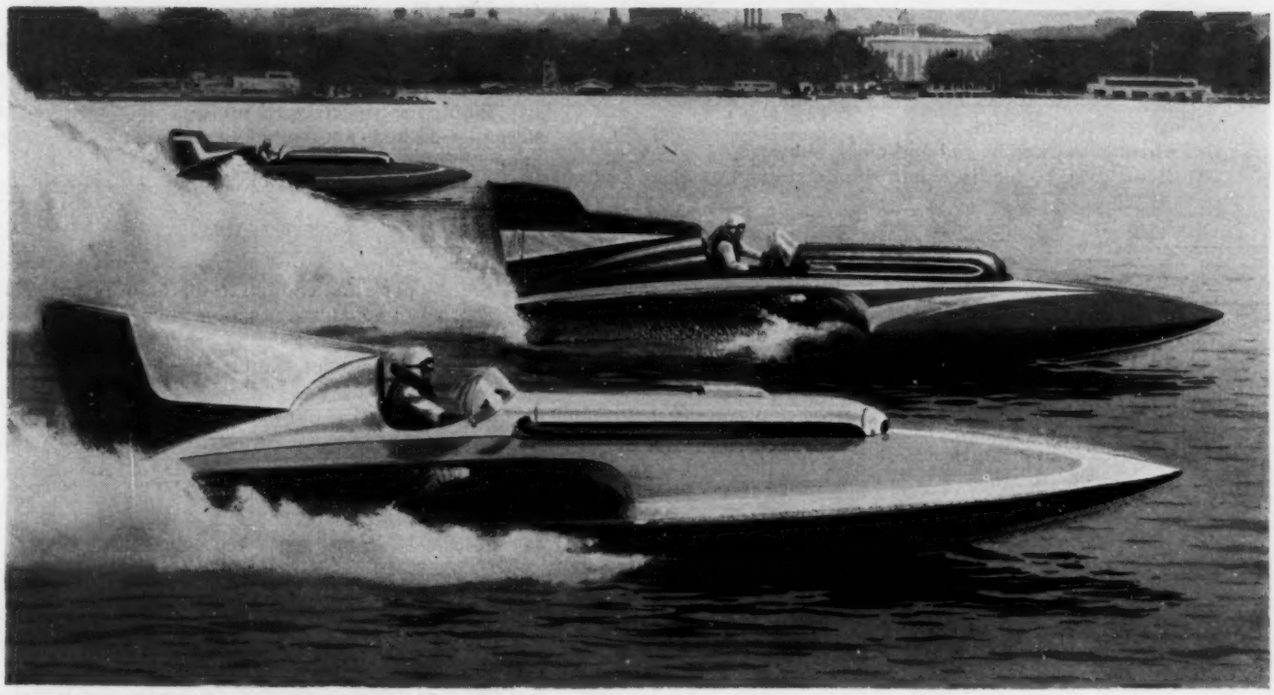
For salt water use, bronze or monel fastenings are recommended. For fresh water, hot-dipped galvanized steel fastenings are adequate.

ITEM	QUANTITY	SIZE	KIND
Gussets to Frames	42	1½" No. 12	Flat Head Screws
Frame to Transom	20	1¼" No. 12	Flat Head Screws
Doubler to Transom	10	1¼" No. 12	Flat Head Screws
Keel Batten to Frames and Transom	9	2" No. 14	Flat Head Screws
Keel Batten to Forefoot	4	2" No. 14	Flat Head Screws
Frame No. 1 to Forefoot	2	2" No. 14	Flat Head Screws
Transom Knee	4	¼" (3½") (4") (2. 5")	Galv. Carriage Bolts
Chine to Frames and Stem	12	2" No. 14	Flat Head Screws
Seat Riser to Frames and Stem	12	1¼" No. 10	Flat Head Screws
Sheer Batten to Frames and Stem	12	1¼" No. 10	Flat Head Screws
Bottom Battens to Frames	18	1¼" No. 10	Flat Head Screws
Gunwale to Frames	8	1¼" No. 10	Flat Head Screws
Bottom Planking to Frames & Transom	36	1" No. 8	Flat Head Screws

ITEM	QUANTITY	SIZE	KIND
Bottom Planking to Stem	24	1" No. 8	Flat Head Screws
Bottom Planking to Chine and Keel Batten	100	¾" No. 8	Flat Head Screws
Bottom Planking to Battens	72	⅝" No. 8	Flat Head Screws
Side Planking to Frames, Transom and Stem	68	1" No. 8	Flat Head Screws
Side Planking to Chine	108	¾" No. 8	Flat Head Screws
Side Planking to Seat Riser and Sheer Batten	144	⅝" No. 8	Flat Head Screws
Spray Rail	42	1½" No. 12	Flat Head Screws
Guard	54	1½" No. 10	Flat Head Screws
Keel to Keel Batten	12	1½" No. 10	Flat Head Screws
Toe Rail	24	1½" No. 8	Flat Head Screws
Quarter Knees to Transom	4	2" No. 14	Flat Head Screws
Quarter Knees to Planking and Sheer Batten	4	2" No. 14	Flat Head Screws
Stem to Breast-Hook	1	¼" x 6"	Galv. Carriage Bolt
Deck to Beams, Etc.	½ Lb.	1" Nails	Galv. or Non-Ferrous

For engine performance that's 4 ways better–

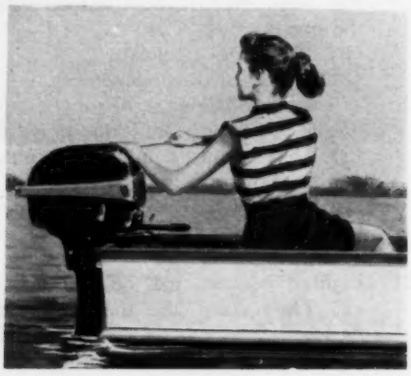
replace your old plugs–with Champions!



1. More Power—Racing proves any engine does its best with Champions. In 1956, 21 of 22 major regattas, from Harmsworth to National Stock Outboard, were swept by Champion-powered craft . . . proof you get *full* power with Champions.

2. Smoother Idle—Fouled plugs cause rough idling. Champion's special gap design fights fouling, keeps your engine humming sweet and low for better trolling, easier docking.

3. Greater Economy—You'll log more knots per tankful when you replace misfiring, gas-wasting plugs with full-firing Champions. Powerfire electrode gives full value for your fuel dollar.



4. Easier Starting—Put a new set of Champions in your engine and take the strain out of starting. Exclusive 5-rib insulator fights flashover, makes for easy, time-saving starts.

Fitting-out time is the time to put extra pleasure in your boating. When you put bright new paint on the hull, put bright new performance in the engine with a fresh set of Champion Spark Plugs. Replacing last season's worn plugs with Champions will give you more power, smoother idle, greater economy, and easier starting. That adds up to plenty of extra pleasure. So remember, replace those old plugs—with Champions!

Experienced skippers choose

CHAMPION

SPARK PLUGS

CHAMPION SPARK PLUG CO. TOLEDO 1, OHIO

TEST YOUR SEAMANSHIP

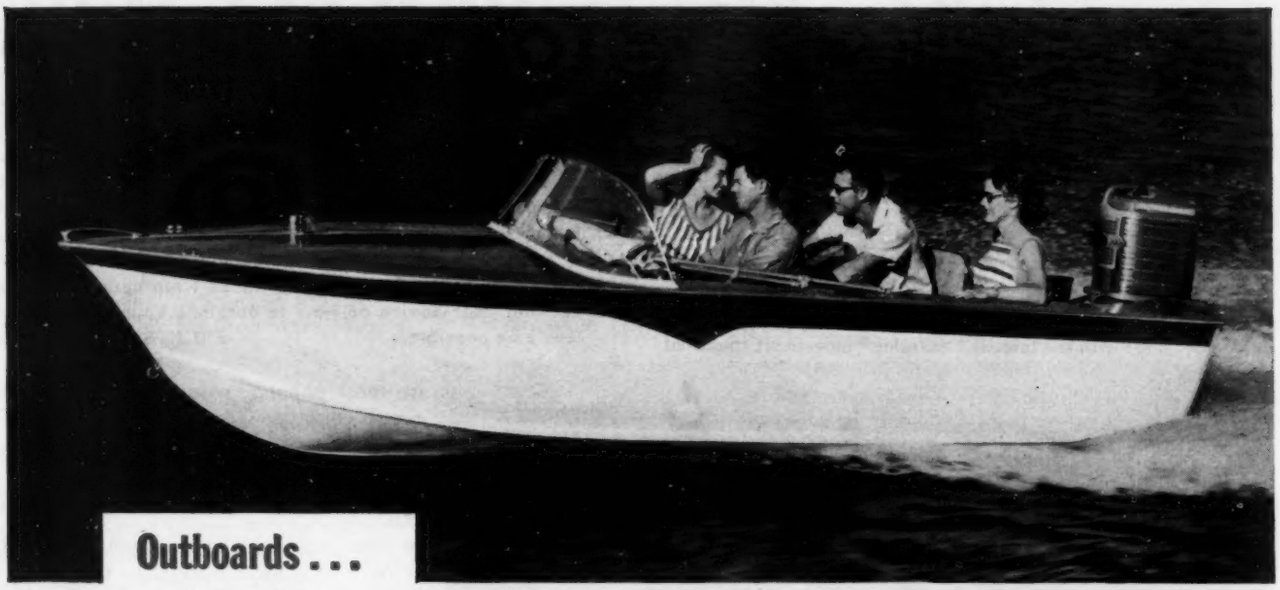
(*continued from page* 21)

13. A bailer or pump, anchor, paddle and lines are required on all small boats by:
    (a) Coast Guard regulations.
    (b) Inland piloting rules.
    (c) Common sense.
14. Your boat and motor are stated to be good for 25 mph. For safe navigation:
    (a) Multiply this speed by 1.15 to obtain nautical miles, shown on the chart.
    (b) Judge boat speed by a tachometer.
    (c) Use a boat speedometer or log, and check it against a measured run.
15. In a channel marked by red and black buoys,
    (a) Boats over 16 feet in length should steer clear of the red buoys.
    (b) Keep on a course between the red and black buoys.
    (c) Steer from one black buoy to the next.
16. To lay out a compass course on the chart, change True to Magnetic bearings by:
    (a) Subtracting Magnetic Variation from the True course desired.
    (b) Finding the Magnetic course corresponding to the True course on a chart Rose.
    (c) Set the course protractor over the same amount as the Magnetic Variation.
17. Allow for current in your piloting:
    (a) Unless you are going with the current.
    (b) Except when it is a slight cross current.
    (c) Whenever the drift during the time underway would be important.
    (d) Only if your boat is fairly slow.
18. If visibility diminishes:
    (a) Anchor.
    (b) Attempt to establish a position and a safe course to shore.
    (c) Head back for the last object seen.
19. To take a bearing of an object:
    (a) Sight over the compass card or head the boat for the object.
    (b) You need a pelorus.
    (c) Line it up with something else on shore.
20. When two objects are *in range*, they give an excellent line of position. In this condition:
    (a) They are just coming into sight, and their distance will be shown on the chart.
    (b) You are half-way between them.
    (c) They are directly in line of vision with one another.
21. Lighted beacons can be identified at night by:
    (a) Their color and the length and spacing of the flashes.
    (b) Their distance above water.
    (c) Their extreme brightness.
22. Most small boat accidents are caused by:
    (a) Going out too far and being lost at sea.
    (b) General carelessness.
    (c) Collision and running onto rocks.
    (d) Unsafe fueling procedure.
23. The number of passengers which can safely be carried in an outboard boat:
    (a) Is usually determined by the manufacturer's rating.
    (b) Is one for every seating space aboard.
    (c) Is one for every two feet of length.
24. If you are out in a small boat and the weather turns rough:
    (a) Look to see if there are other boats around, and advise them to turn back.
    (b) Have all hands put on lifejackets, quarter the seas.
    (c) Anchor until conditions improve.
25. Sometimes a boat may unavoidably turn over. In this case:
    (a) Have the strongest swimmer aboard head for shore to get help.
    (b) All hands get on one side and push the boat for shore.
    (c) Hang on to the anchor rope and pull the boat.
    (d) Everyone should hold fast to the boat.
26. Passengers riding on the gunwales or bow should:
    (a) Change position only after advising the skipper.
    (b) Wear lifejackets at all times.
    (c) Not reach over the side.
    (d) Be made to behave and get back in the boat.
27. Boats which are manned by only one person:
    (a) Should be rigged with lifelines and a means of stopping the boat automatically if the hand leaves the helm.
    (b) Should have some way for a person to climb back on board.
28. "Man Overboard drill" should be practiced:
    (a) On every boat over 16 feet in length.
    (b) By all boats, and enough to maintain proper skill.
    (c) Whenever a boat carries more than its rated number of passengers.
29. Flares, oars or paddles, water and provisions should be carried:
    (a) Whenever setting out on an overnight jaunt.
    (b) In any waters extensive enough to get in trouble on.
    (c) In any areas not patrolled by the U.S.C.G.
30. To be safe from the possibility of sinking:
    (a) Go slowly around rocks and debris.
    (b) If a heavy rain starts, head for shore.
    (c) Keep tab on the amount of water in the bilge.
31. Signalling equipment and ability is called for:
    (a) On any boat over 26 feet in length.
    (b) On all boats except outboards.
    (c) On any boat, sufficient to communicate with others nearby.
32. A two-way radiotelephone can be carried:
    (a) Only on boats having inboard engines.
    (b) On any boat.
    (c) If there is at least a 6- or 12-volt battery aboard.
33. Radiotelephone-equipped boats can be located:
    (a) By short-wave radio direction-finder bearings.
    (b) When they start sounding the loudest.
    (c) By cruising around, listening for a signal.
34. You see a boat flying a blue-and-white checkered flag with a blue, white and red-striped one below.
    (a) He is a member of a visiting yacht club.
    (b) He is in distress and is calling for help.
    (c) You are headed for the rocks.
35. A boat flies a flag diagonally divided, red and yellow.
    (a) He has a man overboard.
    (b) Stand clear, because he is altering course.
    (c) This is a race committee boat.
36. It is dark, and you see a light flashing 3 shorts, 3 longs, and 3 shorts.
    (a) This is the marker for a harbor entrance.
    (b) This is the Morse code signal of distress.

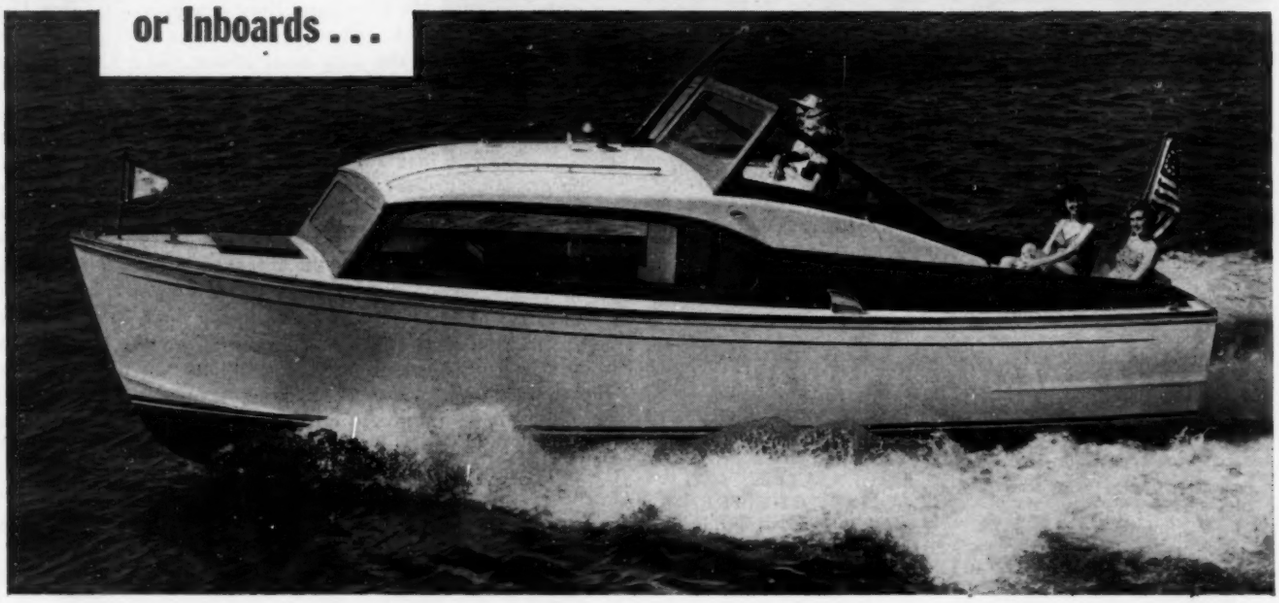
And incidentally, several boats have been saved lately through using this simple signal. One of them was hopelessly out of sight of land or other boats, but the skipper had enough presence of mind to signal a passing plane. The plane then radioed for help. And that illustrates the crux of Seamanship—knowing the right thing to do, at the right time.

SEAMANSHIP QUIZ ANSWERS

1. (c)	7. (b)	13. (c)	19. (a)	25. (d)	31. (c)
2. (c)	8. (c)	14. (c)	20. (c)	26. (d)	32. (b)
3. (c)	9. (c)	15. (b)	21. (a)	27. (a)	33. (a)
4. (a)	10. (b)	16. (b)	22. (b)	28. (b)	34. (b)
5. (b)	11. (d)	17. (c)	23. (a)	29. (b)	35. (a)
6. (c)	12. (b)	18. (b)	24. (b)	30. (c)	36. (b)



Outboards . . .
or Inboards . . .



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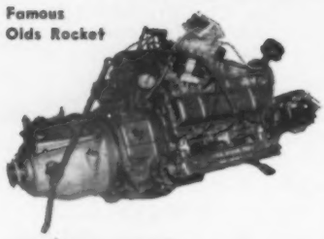

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HERE'S HOW

(*continued from page* 12)

"Out here on the Pacific coast, as far as I have been able to find out, no boat works has any kind of houseboat in production except Neptuna Corp., Glendale, Calif. Although this is an excellent craft, I plan no trailer trips; so I prefer a houseboat without built-in trailer wheels. I am also interested in one with an inboard motor. Since the cost of transporting such a boat from a builder outside California to my home would be prohibitive as far as I am concerned, I am seeking your advice on how to obtain a houseboat as painlessly as possible. **E.D.J., San Jose, Calif.**

Houseboats are most popular, naturally enough, in the Midwest, where our country's greatest rivers flow. The great majority of builders of stock houseboats are, therefore, concentrated in this area. As you indicate, the cost of shipping a houseboat from one of these builders to either coast is tremendous.

One solution to your problem is to build your boat yourself or to have it built in a local boatyard. Plans can be obtained from the Cleveland Boat Blueprint Co., Box 1651, Cleveland 4, Ohio. Other possible sources of plans and/or information are the Universal Motor Co., 315 Universal Drive, Oshkosh, Wis., and the Red Wing Marine Corp., Red Wing, Minn.

"I desire to insulate the engine compartment of my twin-screw cabin cruiser to cut down the noise. Will you recommend the kind of insulation I should use? Since some water leaks through the decks into the engine compartment, the insulation should not absorb moisture."
I.B.W., Norfolk, Va.

The object of sound insulation, of course, is to absorb as much air-borne sound as possible. Not only, however, will it absorb much of the noise transmitted through the deck, engine hatch and bulkheads, but it will also eliminate within the engine room echos and reverberations that become amplified and bothersome all over the boat. You've heard this amplifying effect when listening to drums, xylophones and stringed instruments. An insulated engine compartment works the same way.

Among the sound-absorbing materials, those most suitable for your purpose are:

Celotex Company's Acousti Celotex B, which is perforated with many little sound-absorbing holes.

Johns Manville's Transits Acoustical Tile Pad, which consists of a pad plus a perforated Transit facing. This material is efficient, but is quite heavy.

Cork Insulating Company's Marine Cork, an oven-dried and baked cork that comes in various thicknesses, readily absorbs sound, is light in weight, is fire and moisture-resistant, exerts no capillary action when immersed in water and has a smooth surface that can be coated with acoustical paint.

Line as much of the engine compartment as possible with the sound-insulating material selected. This includes the deck over the compartment, the hatches in that deck, and the forward and after bulkheads. Most bulkheads serve as mounting places for switchboards, wiring, shelves, etc. If possible, remove these before installing the insulating material and remount them after the material has been applied.

One more thing—sound insulation alone is not enough. To prevent the escape of sound, every little hole and crack between the engine compartment and the rest of the boat should be closed up. Every control lever and every line leaving the compartment should pass through as small an opening as possible and should have a rubber or felt gasket around it. And the hatches to the compartment should close tightly on sponge-rubber gaskets. ◆

BOAT CLUB BEACONS

(Reports of club events conducted to further community boating facilities, welfare, and water safety will be welcomed for publication in this column. POPULAR BOATING *will pay $10 for each report published. The editors, of course, reserve the right to determine what material merits publication and to edit all submissions. Reports should be sent to Virginia Hewel, The Boat Club Beacon,* POPULAR BOATING, *366 Madison Ave., New York 17, N. Y.)*

SAFE SAILING

We of the Win'ard Yacht Club of Redondo Beach have sponsored and are furnishing guidance for a high school activity aimed at promoting safety and good seamanship in sailing and boat handling. Under the plan, each school furnishes a counselor, the students elect their own commanders and our club furnishes guidance to the groups.—C. P. Moore, Chairman of the Entertainment Committee, The Winard Yacht Club, Redondo Beach, Calif.

COMRADELY COMPETITION

The Arkansas Power Boat Association is comprised of a group of section clubs whose aim is to promote recreation on the waterways, safe conduct in water sports and promote friendly competition between sectional clubs as well as further good will and comradeship amongst those who seek enjoyment through boat racing and water sports. Our association is a sanctioning body for the section in which we live and is closely affiliated with the National Outboard Association. Some races, such as "J" class (for women and children) and "B" Utility Runabout which are not sanctioned nationally, are governed by our association.

To stimulate friendly competition, awards, such as our Traveling trophy, for the most progressive club, and our Good Sportsmanship trophy, are awarded annually. This year the club trophy went to the El Dorado Boat Club, and Buddy Halliburton, of Texarkana, took home the Good Sportsmanship trophy.—Mrs. Eugene Bylander, Publicity Chairman, Arkansas Power Boat Association, Little Rock, Ark.

GOOD WILL CRUISE

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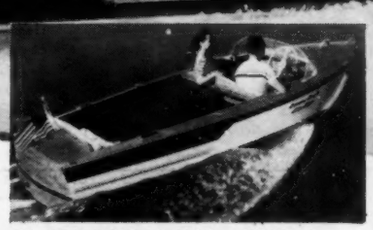

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Club, from Minnesota to Florida, turned out to be something of a good will tour in that the Minnesotans were able to meet and enjoy the hospitality of a number of club groups in Florida.

As host club we of the Gainesville Boating Club gave a banquet for the visitors and our Chamber of Commerce presented each of the 32 participants with a bag of oranges fresh from our local Cross Creek Grove.

At their next port of call, in Leesburg, Fla., the travelers were met by Mr. Pat O'Keefe, of the Leesburg Club, and given a further taste of southern hospitality which included the use of the local club house facilities, plus an evening of entertainment.

At West Palm Beach the Minnesotans were entertained at a cocktail party given by Mr. Jim Vaughn, and later enjoyed a barbecue hosted by the local club and Chamber of Commerce of Riveria Beach.

Their appetites whetted by ten days of cruising Floridian waters, the suntanned travelers expressed unanimously the opinion that they could hardly wait for their own boating season to start, back home in Minnesota. —Rev. Wallace Pomplun, Chaplain and Chairman, Gainesville Boating Club, Gainesville, Fla.

A MEETING OF IDEAS

Operating on the theory that amongst our Cincinnati Out Board Runabout Association's 200 members there are a lot of good ideas that never come to light, we planned a special meeting at which our members were given the opportunity to express their views and suggestions for more boating fun for all. Ideas and suggestions on specific subjects, such as cruises and entertainment, were invited and members were encouraged to add or improve on the ideas submitted. Each was limited to one minute per idea.

The meeting proved to be a fruitful one and we feel it will result in increased fun on the water for our members during the coming season. —Cincinnati Out Board Runabout Assoc., Inc., Cincinnati, Ohio.

SPOTLIGHT ON THE RACES

"Our club is working on plans to make outboard racing a more interesting sport spectator-wise.

"We are establishing a trophy for the best appearing outfit . . . driver, pit crew, etc. In addition, we are formulating ideas for improvement in our Judges' Stand Starting Block, Officials' Trailer and Sound Trailer.

"A must on our 1957 agenda is the stressing of safety. We started our drive in the February "Prop-Wash" and will continue throughout the racing season in an endeavor to have a safe 1957."—From "The Prop-Wash" Publication of Central States Racing Assoc., Rock Island, Ill.

NEW & NAUTICAL

(*continued from page* 8)

finish that dries in an hour's time has been introduced by Surface Coating Engineers, Inc., Newark, N. J. It is available in a variety of colors and is applied like paint. The manufacturer claims that it gives complete waterproof protection that lasts for years. This new product is an elastic vinyl liquid with perfect adhesion and a 100% stretch that makes it crackproof. Tests have shown that Vinylon coatings also serve as a protection when boats strike or scrape against docks or other floating or submerged objects.

An interesting item in this field that has come to our attention is a new type of plastic metal, Magic Plastic Aluminum, manufactured by The Magic Iron Cement Company, 5403 Bower Ave., Cleveland, Ohio. This metal mender is applied without heat or tools to any damaged metal surface. It is said that within three hours the plastic dries hard and retains the same characteristics of the surface on which it is used. It can then be drilled, filed, taped or threaded; and the resulting seal is watertight, gasoline-proof, and can withstand temperatures up to 600° F. It is priced at $1.00 for a four ounce self applicator tube.

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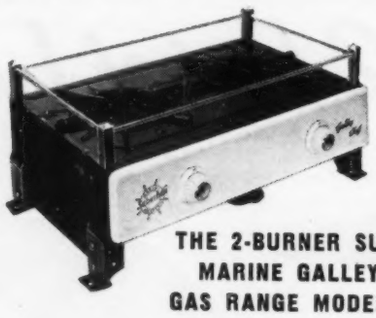

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Race Your Boat Right by Arthur Knapp, Jr. Introduction by Harold S. Vanderbilt. 296 plus XIII pages, illustrated. D. Van Nostrand Company, Inc. An outstanding volume on closed course racing.

Vastness Of The Sea by Bernard Gorsky. 302 pages, illustrated. Little Brown & Company. Price $5.00. The engrossing story of the author and his three spear-fishing companions on a 40-foot cutter, as they literally hunt their way, port to port, from the Mediterranean to the West Indies and across the Pacific to the Marquesas and Tahiti.

Sea-Wyf by J. M. Scott. E. P. Dutton & Co., Inc. Price $3.50. A suspenseful survival at sea story in which a ship is torpedoed by a Japanese submarine in the middle of the Indian Ocean.

Boat Carpentry by Hervey Garrett Smith. 178 plus VI pages, illustrated. D. Van Nostrand Company, Inc. An indispensable guide to the boat owner, whether he is making alterations, repairing damage, or building his own boat.

American Ferryboats by John Perry. 182 pages, illustrated. Wilfred Funk, Inc. Price $3.95. The American Ferry played many roles in the growth of this nation. For those who have only vague recollections of the ferry, this book brings 300 years of its colorful history vividly to life.

Tugboat, The Moran Story, by Eugene Moran and Louis Reid. 376 pages, illustrated. Charles Scribner's Sons. Price $5.95. The story of the tugboat, from the time when they towed high-masted clippers and coastal sailing vessels, to their tows of today, the giant, transoceanic liners.

The Enemy Below by Commander D. R. Rayner. Henry Holt & Company. Price $3.00. A battle to the death between a destroyer versus a U-boat in the lonely reaches of the mid-Atlantic. A great tale of the sea.

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The Picnic Book by Marian Tracy. 160 pages, illustrated. Charles Scribners Sons. A book devoted solely to the subject of picnics, it consists of about 100 picnic meals with recipes where needed and a shopping and packing list with each one.

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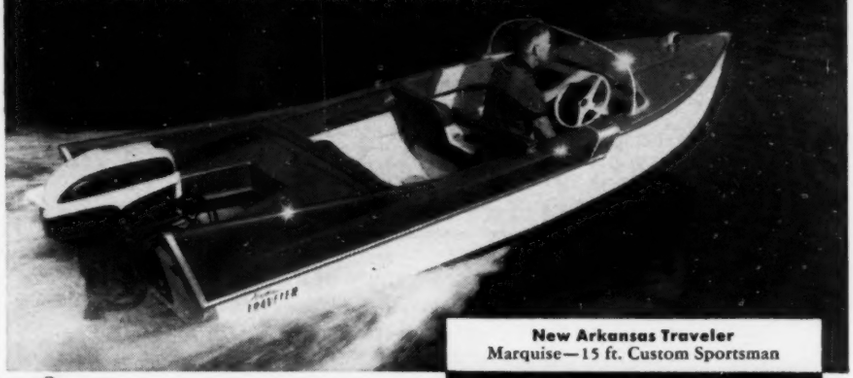

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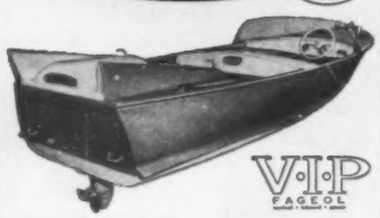

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Modern Naval Architecture by W. Muckle, 154 pages, illustrated. Philosophical Library. Price $4.75.

Outboard Motors And Other Two-Cycle Engines. Frazee-Bedell-Venk. American Technical Society. Price $3.95.

Celestial Navigation For Yachtsmen by Mary Blewitt. 64 pages, illustrated. Philosophical Library, Inc. Price $2.75.

The Compleat Cruiser by L. Francis Herreshoff. 372 pages. Sheridan House. Price $5.00.

The Encyclopedia Of Outboard Motorboating by Hank W. Bowman. A. S. Barnes and Company, Inc. Price $5.75.

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Sailing Illustrated by Patrick M. Royce. 325 pages, illustrated. Royce Publications. Price $3.00.

The Cruising Cookbook by Russell K. Jones and C. McKim Norton. 302 pages. W. W. Norton & Company, Inc. Price $3.95.

Piloting, Seamanship And Small Boat Handling by Charles F. Chapman. 493 pages, illustrated. Motor Boating. Price $4.00.

Better Small Boat Sailing by John Foster. 145 pages, illustrated. Adlard Coles Limited. Price $3.00.

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Seamanship by T. F. Wickham. 192 pages, illustrated. Houghton Mifflin Company. Price $3.75.

High-Speed Small Craft (Second Edition) by Peter du Cane. 324 pages, illustrated. Temple Press Limited.

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Rigs And Rigging Of Yachts by D. Phillips-Birt. A.M.I.N.A. 204 pages, illustrated. Adlard Coles Limited. Price $8.00.

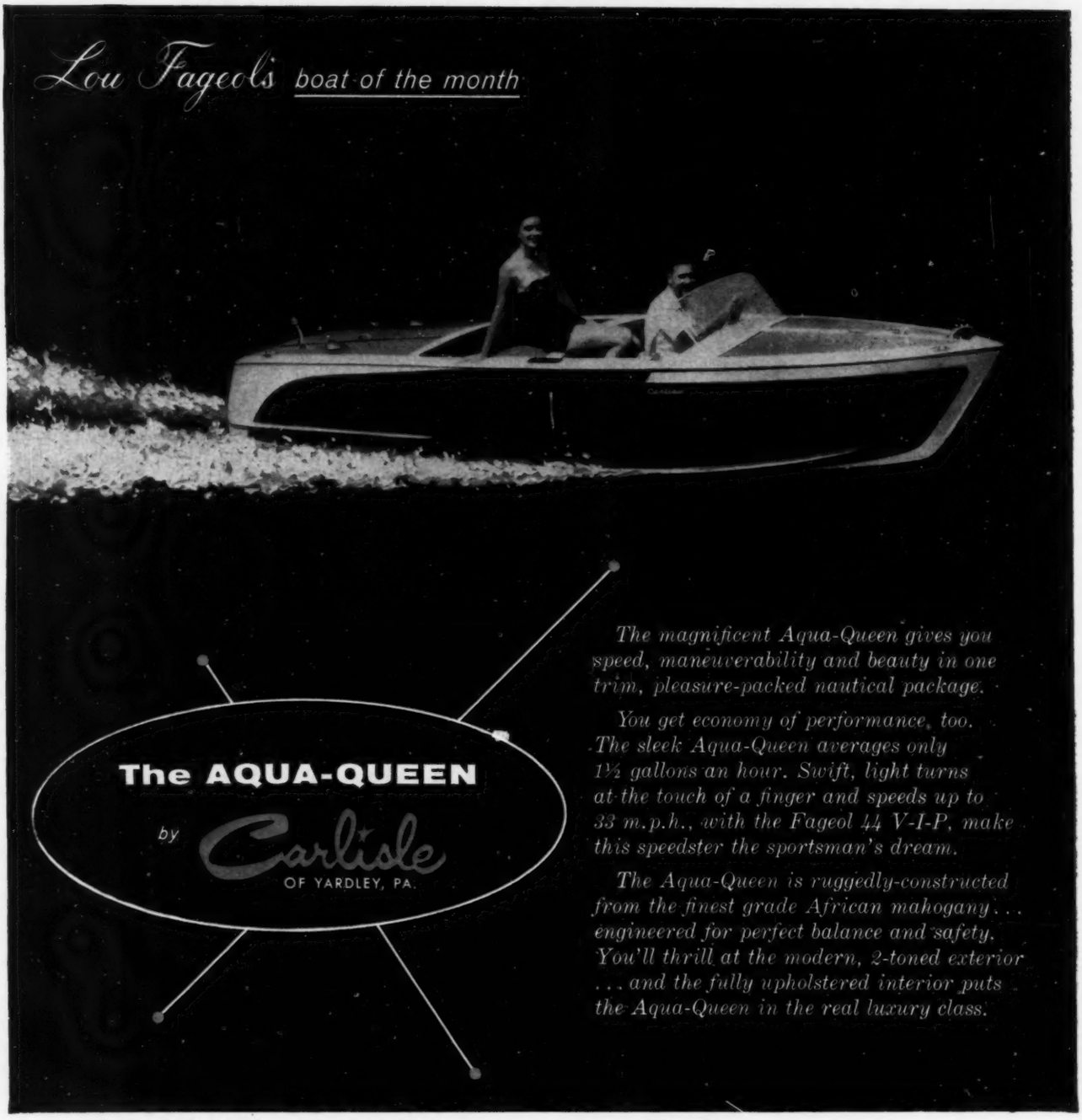
Your First Boat by David Klein. 213 pages, illustrated. Wilfred Funk, Inc. Price $2.95.

OffShore (Revised and enlarged edition) by John H. Illingworth. 307 pages, illustrated. Adlard Coles Ltd. Price $12.50.

Outboard Boating Handbook (New and revised edition) by Hank W. Bowman. 144 pages, illustrated. Arco Publishing Company. Price $2.00.

Vagabonding Under Sail by W. I. B. Crealock. 304 pages, illustrated. Hastings House. Price $5.50.

Lou Fageol's boat of the month



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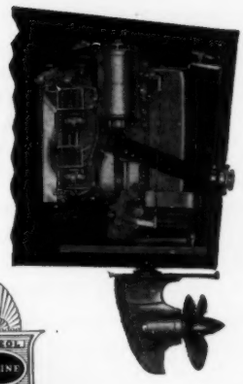

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WORK WITH PLYWOOD

(*continued from page 45*)

Most modern glues do not develop full strength unless considerable pressure is applied to the joint while the glue is setting. I do not think a dozen screws will develop adequate, uniform pressure. Also, in thin plywood there will be a tendency for the plywood to "hump" between screws. The resulting splice will be only too visible on the finished boat! If I were making a butt block splice I would use a number of machine screws and nuts to bolt the butt block in alignment, and would apply pressure to the joint by means of heavy blocks and clamps. A splice made this way will be flatter and more uniform. The glue should fill any small gaps between panels completely so water won't get into the grain.

Referring back to the right and wrong ways to put plastic wood over screw heads, remember if it is dabbed on heavily it will be a lot of extra work to sand off the surplus. Not only that, but the sanding will do something to the surrounding plywood that will ruin the appearance of the boat.

Here is one of those tricks of the trade a man would never hit upon until *after* he'd made the same mistake several times. Look at a piece of fir plywood and observe its wavy grain. The light areas are soft wood and the dark areas are hard wood. To fully appreciate how really soft the light areas are, draw a medium-blunt pencil point over a scrap of the material. When a piece of fir plywood is sandpapered vigorously, the sandpaper tends to slide over the harder areas and eat out the soft areas. *Do not sandpaper bare fir plywood.* It does not need to be sanded, because it has been sanded for you in the plywood mill on large drum-type sanders which cut the surface off smoothly without digging into the soft areas. Sanding it yourself merely undos the good work special machinery has done.

A few words about sandpaper are in order. Ordinary "sandpaper," properly called flint paper and distinguished by its yellowish color, is quite soft and does not last long when used on boat work. Instead, use either aluminum oxide or garnet papers, which cost more but are so much harder and more durable that their superior performance is well worth while.

The first paint coat should be any of several brands of clear liquids known as plywood sealers. They do much to keep this species of wood from checking when it is exposed to weather and prepare the wood for an application of marine undercoater, which is a white primer especially compounded to fill in and build up the surface. It sandpapers well, and you can sand it as much as you want to with no danger of cutting into the wood itself. If you would like to have a glass-smooth paint job, you can get it by applying three or four coats of undercoater and sanding each down with a sponge rubber sanding block until all brush marks have disappeared. Finish with marine enamel and you'll be proud of your boat.—BOB WHITTIER

ROT RESISTANCE

In response to numerous requests following Bob Whittier's fine analysis of dry rot in February POPULAR BOATING, *here is his appraisal of comparative rot resistance.*—Ed.

Wood experts have been able, through controlled experiments, to classify a number of the more important wood species in the order of their susceptibility to rot, and the results of the tests tally very nicely with the observations made in actual practice. There are about two thousand known species of useful woods, among which we can find practically any desired characteristics for a given application. An accompanying table lists some of the more common woods plus a few you probably never heard of. We are accustomed to thinking of timber as coming from the "North Woods," and this line of thought makes us readily accept the oft-made statement that wood is getting scarce and substitutes have got to be found. We tend to overlook the largely untapped supply of useful woods growing in tropical and semi-tropical regions. The strange-sounding names on this list are woods which have actually been used, or proposed for use, in boats both in Europe and America. While perhaps not the complete answer to wood shortages, they do merit careful investigation.

What makes some woods more rot-resistant than others is not hardness, or weight, but their chemical content. Cedar and teak, for example, contain a natural oil, while there seems to be something in other species which acts as a fungicide. We can, nevertheless, make use of many plentiful woods of moderate rot resistance by treating them with wood preservatives.

Two of the tropical woods in the rot-resistance list are already in widespread use by manufacturers of small boats —gaboon and utile. Perhaps you have admired the honey-colored and light brown decks and interiors of runabouts at the boat show; you thought it was mahogany, but the chances are high that it was actually one of these woods. The salesman may have called your attention to the handsome "mahogany" woodwork and, because he feared you would be puzzled or suspicious, did not use the real name which could have been gaboon, utile, tiama, khaya, lauan, tanguile, okoume, or samara! Perhaps he did term some of the woodwork "genuine Philippine Mahogany." This may come as a blow to your cherished notions, but "Philippine Mahogany" is merely a fine-sounding trade name for lauan and tanguile. It isn't as hard or strong as the real old boatbuilder's Honduras Mahogany, it will bleach out white when exposed to weather instead of retaining a natural rich brown color, and, on top of that, it is *not* a very expensive wood . . . it sells for about the same price as common white oak. It is an excellent wood for boat planking, however.

ROT RESISTANCE OF WOOD

VERY RESISTANT	
Afrormosia	Locust, Black
Afzelia	Makore
Ekki	Opepe
Greenheart	Osage Orange
Iroko	Tallowwood
	Teak
RESISTANT	
Agba	
Cedar*	Mahogany, Honduras
Chestnut	Oak, American White
Cypress	Redwood
Freijo	Utile
Guarea	Yew, Pacific
Pine, Long Leaf Yellow	
MODERATELY RESISTANT	
African Walnut	
Danta	Krabak
Douglas Fir	Larch (Hackmatack)
Gedu Nohor	Mahogany, African
Gum, Red	Mahogany, Philippine
Gurjun	Oak, American Red
Hemlock	Sapele
Hickory	
NON-RESISTANT	
Aspen	Fir, Commercial White
Basswood	Gaboon
Cottonwood	Spruce#
Elm	
PERISHABLE	
Ash	Beech
Balsa	Birch

KEY

Based on approximate life of specimens buried in the ground

Very Resistant	More than 25 years
Resistant	15 to 25 years
Moderately Resistant	10 to 15 years
Non-Resistant	5 to 10 years
Perishable	less than 5 years

* Alaska, Eastern Red, Northern White, Port Orford, Southern White and Western Red

\# Baltic, Black, Engelmann, Red, Sitka and White

(*continued from page* 41)

is crisscrossed by 97,000 linear miles of triangulations which provide a rigid framework for maps and charts. Continuous, accurate triangulation now sweeps up from the lower end of Mexico through the U.S., Canada, Yukon Territory and western Alaska to Little Diomede Island in the Bering Strait.

Not only that, but from some 150,000 triangulation stations (markers on chimneys, spires and cupolas), engineers can begin or end local surveys. In 380,000 miles of levelling, the Survey also thoughtfully deposited more than 275,000 brass discs or "bench marks" in rock outcroppings, large buildings and special concrete posts to preserve elevations.

In 1807, when the United States stretched from Maine to Georgia, Congress authorized President Jefferson "to cause a survey to be made of the coast, of the outlying islands and fishing banks." No mean scientist himself, Jefferson sought advice from the American Philosophical Society in Philadelphia, then the leading scientific body in the young country.

After studying various plans, the society endorsed the proposal of Ferdinand Hassler for "a complete triangulation survey of the whole coast, including the determination of latitude, longitude and azimuths of the principal places and bases measured with the greatest possible accuracy." Hassler, who had come to the U.S. only two years earlier to teach mathematics at West Point and Union College in Schenectady, promptly became chief of "The Coast Survey."

Not surprisingly, some politicians were impatient with Hassler's insistence on elaborate base measurements and triangulation systems. No doubt, too, the early traders and whalers who sailed by spit, guess and a taste of the mud from the bottom had scornful reservations about the queer foreigner. Who had ever heard tell of beginning a chart with surveyor's gear instead of a handline!

But Hassler stuck to his scientific guns, insisting on rigid triangulation controls so that the future charts made in any locality would exactly match those in any other area.

As a result, his realized dream of coordinated surveys formed the framework for the accurate charts we enjoy today, and his perfectionist standards for triangulation closure in primary triangulation were so severe that they still hold good. Triangulations executed by him more than 135 years ago are included in the present-day systems.

But war, the rough pioneer terrain, shortage of funds and lack of scientific tools all hampered him badly. Hassler had to scour Europe to find various instruments and supervise the design and construction of others. Next, the War of 1812 delayed him, and it was 1816 before field work began. Two years later, Congress deprived the Survey of funds.

Fortunately, most of the little country's population and industry was concentrated along the coastal plain, commerce was chiefly waterborne, fisheries and shipbuilding were major industries—and all demanded accurate charts. In 1832, when Congress authorized a survey of the Florida coast, work resumed. Practically ever since, the Survey has been trying to keep abreast of America's territorial expansion North, South and West.

In his methodical way, Hassler began with the measurement of two baselines at English Neighbourhood, New Jersey, and Gravesend Bay Beach, Long Island, New York. In 1834, four maps of the triangulation scheme around New York, Long Island and Connecticut were published, but offshore hydrographic detail was lacking. The following year, Lieut. Gedney, commanding the schooner *Experi-*

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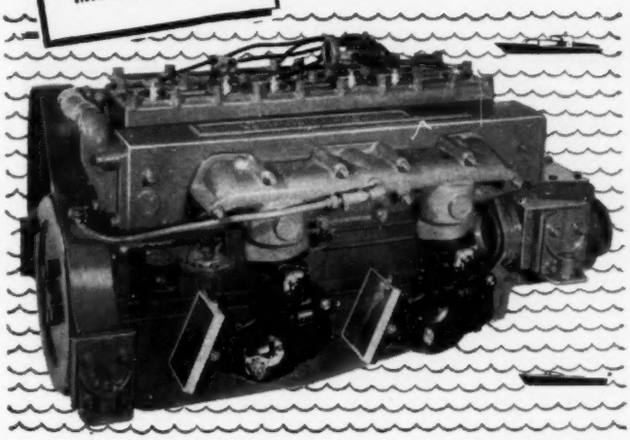

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ment, directed the first hydrographic survey along Great South Bay and the Long Island south shore, and in 1839, the first chart (a stone-engraved rendition of Newark Harbor) was published.

In 1840, the Survey obtained its first vessel to be used in extensive oceanographic investigation. This was the smart brig *Washington*, a converted revenue cutter, fast, responsive—and jinxed, as some good ships are.

Hassler's successor, Prof. Alexander D. Bache, ordered the first systematic investigation of the Gulf Stream (an appropriate gesture since his direct ancestor, Benjamin Franklin, had been the first man to direct scientific attention to the Stream's existence). Several years later, coming up from the Stream, the *Washington* was caught in a hurricane and wallowed almost helplessly for a week. She gallantly made port—but her commander and ten members of the crew had been lost at sea.

The Survey old-timers were adventurers, explorers and artists as well as scientists, drew brilliantly and wrote colorful, vigorous reports that sometimes even lapsed into verse. Every line, every figure, every letter was hand-engraved on copperplate by real artists. Their elaborate titles and notes, views of headlands, lighthouses and harbor approaches and lavish use of symbols (many early chart users couldn't read) make them collector's items today.

The Survey retains filed copies of all editions, and in one recent four-month period, more than 1,000 reproductions of the early charts were furnished to individuals and groups interested in their pictorial-historical value. A particular favorite is the 1854 chart of Anacapa Island, in Santa Barbara Channel, Calif. It was executed by no less an artist than James McNeill Whistler during the brief time he worked for the Survey.

Unfortunately, Whistler and the Survey didn't see eye to eye, especially on the matter of punctuality. "It was not that I arrived too late in the morning," Whistler plaintively explained later, "but that the office opened too early."

Coast and Geodetic is a smart, shipshape operation, and its commissioned officers carry titles ranging from rear admiral down through ensign; its uncommissioned probationers are "deck officers." But it is *not*, as many persons wrongly assume, part of the Navy or Coast Guard. Actually, it is a civilian branch of the U.S. Department of Commerce.

The personnel includes some 200 commissioned officers and 2,000 civilian employees, most of them highly-skilled scientists, who are about equally divided between Washington headquarters and the various field installations. The Survey's fleet includes some 15 vessels, six of them major sea-going ships. Pride of the fleet are the 2,000-ton sister ships, *Pathfinder* and *Explorer*, which were built expressly to Survey specifications.

Since Hassler's day, the Survey has made enormous strides in mechanization—in many cases inventing the instruments to solve its unique problems—and thus tries to keep up with its constantly increasing responsibilities.

For example, Hassler had to have a special carriage constructed to carry his theodolite, which is a basic instrument in surveying. Todays light, streamlined model can be carried in the field by one man. His men were badly slowed by forest growths and the earth's curvature, both of which interfered with their vision while they were making surveys. Now, in triangulation work, the Survey uses portable, demountable Bilby steel towers which are toted from site to site by truck.

The Survey has designed its own nine-lens camera for aerial surveys and a nine-lens stereocartograph for plotting the topographic maps based on the camera's photographs. But probably the prize instrument is a cumbersome-looking machine, 16 feet high, 11 feet long and two feet wide, which weighs a little over one ton. Set to predetermined constants, it will give you the times and heights of the tides for *any* part of the world for *any* year!

The tide-predicting machine traces a continuous curve showing hourly variations of tide or current. On dials, it

will indicate the time and height of each high or low tide, or the time of each slack water, and the time and velocity of each strength of current which will occur during the year. Specialists wrestling with problems of sewage and water pollution, engineers whose factories require ample water for their intake pipes at all stages of the tide find such data priceless.

For the mariner, the final result of the Survey's labors are four general types of charts, plus a number of very specialized ones. The major four are:

Sailing—Of smallest scale, the sailing chart is primarily designed for the navigator trying to fix his position as he approaches the coast from the open sea. All features are generalized, and only offshore soundings, radio aids to navigation, the principal lighthouses, outer buoys and landmarks visible for a considerable distance are included.

General—This type of chart is designed for offshore coastwise navigation outside the outlying banks and shoals. The features are somewhat generalized, but not as much so as in the sailing charts.

Coast—Most popular among small-boat owners, yachtsmen and fishermen, the coast charts supply the needed data for inshore coastwise navigation and for entering bays and harbors of considerable width.

Harbor—These charts, for harbors, anchorage areas and the smaller waterways, are scaled large enough to give a picture of the harbor at a quick glance. They include channels, soundings, bottom characteristics, depth curves, shorelines, navigational aids, cable and anchorage areas.

But the Survey also offers a number of "good buys" for specialized needs. From 23 miles south of Sandy Hook to Key West, Fla., the Atlantic Intracoastal Waterway is covered by 22 charts, and the Gulf Intracoastal Waterway, St. Marks, Fla., to Brownsville, Tex., is similarly charted. For very up-to-date navigators, the loran system of navigation is overprinted in distinctive colors on various base charts.

Always an occupational hazard of the big commercial trawlers out of Gloucester and Boston has been the danger of tearing expensive nets on irregular bottoms. Today, thanks to refined techniques in soundings, the Survey furnishes them charts which detail the depths and bottoms. Thus, they know how deep to set their trawls and where to make their runs with the least profanity and most safety. Some of these charts show no land area at all; bearings from several radio stations are indicated, and purple lines carry the courses to and from port.

Commercial fishermen are grateful, too, for the Survey's "Wreck Series," in which green overprint on nine standard nautical charts locates and names all the known wrecks along the Atlantic and Gulf coasts.

These somewhat mournful depictions of Davy Jones' locker were launched during the last war, both to alert surface vessels and submarines to the sunken dangers and also to reassure them that the underwater masses were not lurking enemy subs. Their use has continued on into peacetime. Commercial fishermen study them to steer clear of areas which might foul their nets. Amateur fishermen, knowing that schools often congregate around wrecks, buy them for precisely the opposite reason.

Only one thing really bothers the Survey. They are committed to a job which, because of the restless nature of man and the elements, never can be finished. Each new scientific aid to navigation demands more detailed charting; wind, tide, current, causing erosion and sedimentation, work change in areas just surveyed.

At the same time, Congress has not been exactly generous in its appropriations to Coast and Geodetic. More personnel, more vessels, more scientific tools are badly needed. The value of all the ships and cargoes which safely sail our waters with its charts is calculated at $100 *billions*. For hydrographic survey work, Coast and Geodetic can spend only about $3 millions yearly. Leaving out the lives at stake, 3/1000ths of *1%* is a remarkably low premium for safety insurance!—HENRY LEE

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CHANNEL CHAIN

(*continued from page* 27)

habits. Generally, the wind comes up by 10:30 a.m. Often it increases rapidly during mid-morning hours until it reaches its normal of 18-22 knots. The seas during morning hours are usually calm with a few small wind whipped crests.

Slipping the line at his mooring just east of Highway 101, Otto guides the boat through Balboa's side channels, under the 101 bridge, into the main channel leading to the breakwater and open seas.

Like most Southern California harbors, Balboa is well protected and divided into many side channels which lead to private homes and public moorage. Speed in all channels is limited to five knots. Boats moored well back into the channels of Balboa and Newport Beach require up to half an hour to reach open seas.

Once Otto's Glasspar cruiser passes the lighthouse at the end of the man-made breakwater, the swell of the open seas strikes the boat and speed restrictions are dropped. Otto opens the throttle to cruising speed, places the boat on her heading of 222 and settles the helm for the trip across.

The light displacement fiberglass hull cleaves the seas well and often Otto relaxes in the folding Captain's chair to enjoy the warm California sun and the gentle nip of the salty breezes while his son takes over.

Gradually, the mainland disappears aft the Mary M and the sea gulls scream overhead for food. Further out, from ten to 18 miles, flying fish skitter across the crests and the clear sky gives the ocean a cobalt blue color. Dorsal fins of sharks break the crests from time to time.

This is San Pedro channel, one of the busiest steamer lanes in the Pacific. Often a skipper can spot a tanker bound for the Pacific Northwest, a passenger ship headed for Hawaii or a lumber vessel headed for the Orient. On weekends the skyline is dotted with the billowing white sails of yachts bound for channel island destinations.

Approximately three hours out of Balboa the peaked silhouette of Catalina appears dead ahead. Once seen, the skipper knows he's about one hour out of Avalon harbor. As the engine powers up the wake and pushes the boat ahead, the island looms larger on the horizon and the first faint outlines of Avalon can be seen. Then, the unmistakable shape of the Pavilion, built in 1930 by William Wrigley, is recognizable. The harbor is not far away.

Once inside the harbor buoy line speed is cut to five knots. The harbor, tightly packed with small boats, the yacht club with its spired peak and pier, the fuel floats, the S.S. Avalon at dock with boys diving for money and the glass bottomed boat are familiar sights to local yachtsmen.

Moorage inside the buoy line is meted out by Avalon's popular harbormaster, Chick Upton. A patrol boat meets the boats wishing space and assigns them to a buoy.

Yachts and power boats can be assigned to empty buoys at the discretion of the harbormaster. All moorage is obtained on a term-lease and empty slots are alloted if the registered owner is away. It is possible for a visiting skipper to obtain free moorage if he can produce written permission for moorage from a registered owner.

Free anchorage is available in several spots at Avalon. Boats can anchor off the south harbor at "Lover's Cove" or off St. Catherine's Hotel to the north. Although both are out of the private harbor moorage area they are within easy dinghy-reach of town.

The harbor itself has mooring facilities for 200 larger craft and 20 small boats. There is a fuel dock, on the right of the harbor, at the foot of the Pavilion. It consists of two good-sized floats capable of servicing both outboards and larger vessels. Fuel is reasonably priced: two cents higher than the mainland. In past years there have been repair barge facilities available. Last year there was noth-

ing, but Upton reports that a repair barge is expected in 1957.

Avalon is a popular port for visiting Power Squadrons from San Diego, Newport, Balboa, San Pedro and Santa Monica. It has always been a stop-over for boats cruising the area for there are many stores in the small town. Products as diverse as souveniers and suits are available in town. Cameras and film plus speedy negative processing are offered. Trips to many of the island's more interesting sights are operated on a regular time-table for visitors.

Fishing is a favorite Catalina sport in both mid-channel and island shore areas. Albacore and flying fish are popular catches in the banks and deep water fish such as sheepshead and cod are plentiful for coastline skin diving.

Most game fish are migratory, travelling in cycles controlled by water temperatures and food supply. White sea bass, mackerel, yellowtail, tuna, bonita, marlin and broadbill swordfish are caught from May to October. Albacore seem to have no regular season and are caught any time their fancy takes to the hook.

Fishing or shore leave pleasures are often secondary in Avalon. Many skippers enjoy Catalina most because, like others in the channel group, it is rich in the lore of history.

At daybreak on the 7th of October, 1542, two Carvels rolled over the long swells of the Pacific and sighted land. The Captain, Juan Rodriguez Cabrillo, ordered a long boat and went ashore. He became the first European to sight the islands. The natives, living in stone-age ways, greeted the Spanish sailors and Catalina, then named San Salvador, became noted on history's charts.

By 1814 the island was also well known to citizens of the growing pueblos at Los Angeles and San Pedro. Shipping conditions in Pacific waters had changed. A customhouse was built at Monterey, some 150 miles up the coast, and trading ships were ordered to stop at Monterey to pay cargo duty. The joker in the deck was that the Monterey duty amounted to 100 percent of the value of the cargo.

To circumvent the tariff, knowing skippers took to subterfuge. One of their finest tricks was to stop first at Catalina, unload a major portion of their cargo, then proceed to Monterey where they paid a greatly reduced tariff on visible cargo. They would then return to Catalina, reload and proceed to San Pedro.

Such currently popular windward harbors as Little Harbor in the south and Catalina harbor in the north and lee harbors such as Avalon and the northern Isthmus Cove became smuggler's coves.

In 1854 the Spanish-owned island was granted to Thomas Robbins by Mexican Governor Jose Moreno. During this period a shipwrecked San Pedro sailor, Samuel Prentiss, of the small schooner, Danube, took up one man residence on the island. According to local stories, Prentiss became friends with an island chieftain, Turei. Just before Turei died he disclosed the location of great buried treasure to Prentiss.

Tales of the treasure have been handed down: it has never been found, but in 1854 a rich silver lode was discovered.

Robbins sold the island to the famous California-Mexican family of Don Nicholas Covarubias. In 1863 the island was sold to millionaire James Lick for $80,000. By 1915 the island had passed through a series of hands, all determined to make it a popular resort island. Development had been slow, and visitors were few, but in 1915 it was purchased by William Wrigley whose heirs presently own Catalina. Wrigley spent several millions developing the island. Telephone, moorage, improved glass-bottomed boats and shops were added. In 1930 the Casino, popularly known then as the "Palace of Pleasure," was opened and became Catalina's most popular landmark.

These spots, plus a well-stocked aviary and historical landmarks are easily visited in guided tours or on easy hikes to the central island area. Other Catalina harbors, undeveloped and less habited, are also popular.

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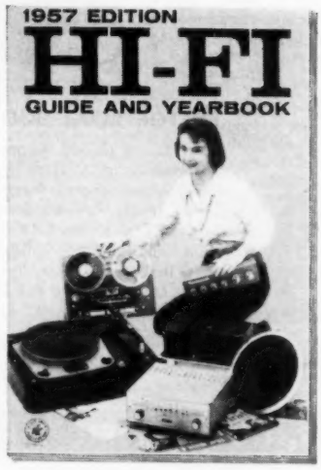

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Sometimes, Otto Bayer, like other California skippers, will make Catalina a lunch break and refuelling spot for cruises to others of the channel islands. One of the most popular visits from Catalina is Santa Barbara Island, west of Catalina, a distance of 20 miles. Like others in the group, it has good harbors and the trip is filled with fun and adventure.

But Catalina is the only developed harbor with boating facilities and skippers may skirt it on the outward trips, often leaving directly from the mainland on cruises to the northern islands, in an effort to conserve fuel and rations.

San Miguel is the western-most island in the channel group. Off Santa Barbara city, on the mainland, it is known as the "Isle of Winds." Blustery breezes harass the island every day of the year. These busy gusts daily rip tons of sand and light gravel off the island into the seas.

San Miguel is famous for its rugged coastline, its great sand dunes and general barrenness. Water runs in a few of the deeper canyons and there is grass on the upper slopes. Robert Brooks, a Carpenteria rancher, leases the 14 square miles from the Navy and raises sheep on the slopes.

Cuyler harbor is the best landing spot on the island. It is here that explorer Cabrillo is believed to have died. A small monument overlooking Cuyler harbor marks the memory.

Santa Rosa Island, a few miles east of San Miguel, was first discovered by Cabrillo, October 18th, 1542. Once owned by the Carillo family, most famous now for actor Leo Carillo, it is presently owned by Vail and Vickers, Los Angeles cattle firm, who at present raise more than 4,000 head of cattle here.

Bechers Bay, on the northeast shore, is the best moorage. It has a pier from which livestock are shipped to Los Angeles.

Santa Cruz, east of Santa Rosa, is the largest of the four upper islands. It lies almost due south of Santa Barbara, on the mainland. It is called the "Island of the Sacred Cross." The silhouette is a jumble of lofty hills, rangy mountains and deep canyons. There is green grass and a good water supply. It was once used as a Mexican penal colony and was later owned by Justinian Caire, a famous California rancher. The rugged Caire stone ranch and two-seat school house still stand.

Today, the island is owned by Edwin Stanton who raises sheep and cattle. He ships from picturesque Prisoner's Harbor. Soon after Stanton's purchase, yachtsmen, who were made welcome on the island, abused landing privileges and shot his cattle. Stanton reluctantly clamped a "No Visitors" rule on the island. It is one of two islands with such a rule, but mooring in harbors is open to all boats.

Its rugged shores form numerous coves where small craft may find friendly shelter. Smuggler's Cove, on the east end is a good refuge from northwest winds. Scorpion Anchorage and Chinese Harbor, on the north shore, are good areas. Ladies Harbor, on the west, is one of the loveliest spots in all of California. Pelican Bay, on the north, is perhaps the best summer harbor.

Painted Cave, equaling the famous grotto at Capri, has a portal over 75 feet high. A cruiser can enter this area, but it's best for a small skiff. Inside, sea lions and beauty mingle.

At the eastern tip of the upper channel chain is Anacapa. In 1938 it was designated a national monument and its narrow chain of three mountains is a familiar landmark to sailors. Anacapa is made up of three separate islands, divided by shallow, rocky channels. Only a dingy can pass through these divisions. The only permanent population on the island are Coast Guard lighthouse keepers whose two lights can be seen for 23 miles.

Santa Barbara, the middle and smallest of the group is situated half way between latitude 33° and 34°, 42 miles southwest of Los Angeles Harbor Light. It has about one

square mile of rock and poor soil. Kelp beds rim its shoreline and landing is dangerous in all but a few spots. It has sea lions and birds. Pictures made on the island are impressive.

San Nicolas, southwest of Santa Barbara Isle, is called "Island of Lost Women". Its name stems from an incident which began in 1830. A boat from the mainland came across to pick up the native population to transport them to more fertile lands located near the Santa Barbara Mission.

The population came aboard willingly with the exception of one woman who escaped the boat party and hid in the island's rocky caves. She was not found until 20 years later when Otter hunters landing on the island managed to capture her. She was brought to the Mission where it was found that none of her tribe could remember their language.

San Clemente, a large volcanic upheaval, at the south of Catalina at a distance of some 20 odd miles, is the southernmost island in the chain. It is owned by the U. S. Navy who uses it for guided missile research. The island is restricted. Civilian vessels are prohibited from passing within one mile of its shorelines. Mosquito harbor, the island's best harbor, has been described as "one of the most picturesque in California".

The chain, about 125 miles in length, is rich in history. A visit to all of them is an exciting experience for boating men, but such a visit is not possible on a two day cruise. It can be done in a week, but instead, skippers often select one or two islands for shorter cruises.

From the Los Angeles area, skippers often head up the coast to the mainland's Santa Barbara, then turn out to Santa Cruz or Santa Rosa. Since fuel is not available at any island except Catalina, these trips require a supply for a two-way trip.

Many skippers plan their cruises so they end at Catalina where they can refuel and enjoy a shore meal before heading back to home port. Most try to leave Catalina before 4 p.m. because evening winds and seas often make the return voyage more difficult than the trip out. Sometimes choppy seas run heavy in the evenings. If tides are wrong, the heavy swells can slow the boat as far out as mid channel.

Returning from Avalon to their home port, boatmen like Otto Bayer steer a straight course for their harbor and generally sight home before dusk. The plastic Del Mar handles easily on such crossings, and on the return trip in choppy seas, her tight hull cleaves through the swells. The cabin is designed to sleep two, and when Otto carries guests, extra sleeping space is allotted either on deck or in the roomy cockpit.

During home-bound trips the closed cabin windows often are flecked with spray.

Shooting the breakwater light as the last weak rays of the day's sun fade behind the ocean's horizon, Otto throttles down and guides the boat back into its home port mooring.

Coming from Avalon to San Pedro on a northing course, the home-bound skipper spots either Point Firmin or Point Vincente. Heading for Santa Monica he'll spot Point Dumas to the north. All are welcome sights to the home-bound skipper; all were named by Cabrillo for Franciscan friars aboard his fleet.

Modern skippers, unable to name land marks after crew members, are just as delighted to spot the mainland. Cruising along the rolling swells of the channel is fun, but it's also work.

"Sure it's work," says Bayer, "but it is the kind of work a boating man enjoys. Nothing could make me miss the fun of cruising the off shore islands."

If the experts are right, this kind of fun will be old hat to increasingly larger numbers of boat owners this year. If California's channel islands are any criterion, new small boat skippers will be sorry they didn't begin years ago.

—Robert Lee Behme

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LOU FAGEOL

(*continued from page* 29)

Fageol had recognized that there was a gap in the booming pleasure boat field—the need for a powerplant between the inboard and the outboard. Outboards were becoming more powerful, heavier, more expensive and less economical on fuel. The inboard trend too was up: more horsepower, higher prices and, with the exception of the Universal Motor Company's vee-drive models at 60 and 75 horsepower, no one was interested in giving the boatman what he might want.

This was a lightweight (180 pounds) inboard that could fit in present outboard runabout hulls 16 feet and up, of four-cylinder, four-cycle design offering considerably less fuel consumption than outboards of comparable horsepower, and equipped with an outboard-type lower unit eliminating the inboard's shaft, strut, propeller and rudder.

This is the Fageol V-I-P, $818 f.o.b. Kent, Ohio. The motor was announced in August, 1956, about a year after Fageol's debut at the Seattle hospital; and in four months 4000 units were sold, for the marine inboard field a reception comparable to the advent of Elvis Presley.

This year will see manufacturers of some 50 outboard hulls offer the Fageol V-I-P as a choice of power.

The president is delighted but not satisfied, true to executive habit. The V-I-P has only 35 horsepower, although additional carburetion and supercharge options can take it to 45 hp. But the options are not too popular, and nine competing outboards are powered at 35 hp, and on up to Mercury's 60-horsepower, six-cylinder giant.

Fageol claims that tests show his motor will out perform outboards of higher power but he knows the public buys numbers, 35 hp., 45 hp., 60 hp., rather than performance claims. The president is well aware of the current horsepower race and in an industry forecast for 1957 he said, "I believe the trend in the small boat market will be toward increased hull capacity and size. Larger hulls will of course require engines of greater horsepower and better performance than those used in the past. By the end of 1957 many small boat owners will, I am sure, insist on and install engines up to 100 horsepower."

There are plans on the Fageol drawing boards for such higher horsepower motors. "We have a number of prototypes in mind along higher power lines," Fageol recently told the author, "but for obvious competitive reasons I don't want to be specific. We believe we can accomplish some truly amazing motors of low weight and high horsepower."

Secrecy aside, the industry speculation is that Fageol will make noteworthy advances in the small inboard field once the firm's marine division adequately establishes itself in production, sales and profit fields with the V-I-P.

The basic motor used by Fageol has an old history. It is a 44 cubic inch four-cylinder type designed in pre-war years and originally called the "Cobra" engine. Its first use was in the Crosley small-sized automobiles. During and after World War II the motor was popular with the services as a powerplant for big portable generators. General Tire bought the dies in 1952 and made a vee-drive marine application, widely advertised as the Aerojet. Fageol in turn bought the production rights and today manufactures it in three types, vee-drive inboard, the V-I-P and also as an outboard of 35 horsepower. The latter, too, is a vertically mounted version.

The present model is recognizable as the old Crosley although modified and improved in many aspects.

Lou Fageol has known the motor intimately for many years, as coincidentally he was a consultant engineer during its original conception in California in the late 1930's.

Fageol spent 15 formative years as a young engineer on the West Coast, and it was there that he began his lengthy racing career.

"My first outboard was an Evinrude racing job," he recently recalled. "I bought it on time. In California I was one of the early 'hop-up' fans, stepping up automobile and outboard engines."

The first race he ever won was an outboard free-for-all at San Joaquin, Calif., May 26, 1928. Fageol can document his 73 future triumphs through the 1954 Gold Cup and he has many of the trophies in his comfortable home at Kent, Ohio.

There were many honors, major and minor, along the way: such long forgotten trophies as "Herman's Smart Shop prize" for an outboard race at Berkeley, Calif., in 1929. The same year Fageol moved up to inboard runabouts, and through the 1930's and '40's his series of boats, usually named *So-Long*, were consistent prize winners in California and on the East Coast.

But Fageol's greatest racing moments came when Lou was well into his forties, the first one at age 44 when he went behind the wheel of Stanley Sayres' *Slo-Mo-Shun IV*, September 2, 1950.

Sayres, an unknown automobile dealer from Seattle, a city with no powerboat reputation at all, startled, in fact shocked, the racing fraternity when he and his designer-driver Ted Jones, unleashed *Slo-Mo-Shun IV* on the unsuspecting Detroiters who had long dominated the Gold Cup world. In June, 1950, *Slo-Mo* broke the old world speed record (141 miles-per-hour) set by England's Sir Malcolm Campbell in 1939. With Sayres driving, *Slo-Mo* did 160.86.

In August *Slo-Mo* won the Gold Cup, Jones driving, and was picked to defend the ancient and honorable Harmsworth Trophy against a Canadian challenger. But Jones had broken his hand and could not drive. Two pilots were available for the asking, one being Fageol, who had a sound, if unspectacular, background in his own Gold Cupper, the underpowered *So-Long*.

The other was a driver with a dare-devil reputation.

Sayres, a neophyte in the big league of boat racing, asked an Eastern authority, "Which one do I take?" The reply, "What do you want most, someone who might win, yet crack up the boat, or someone who may win but is sure to bring the boat back intact?" Sayres' answer, "I want the boat back." Fageol was the selection; *Slo-Mo* won, setting a batch of records in the process, and came home intact.

In looking backwards, this Harmsworth victory, now largely forgotten, still means much to Fageol. If asked today for his greatest racing thrill, Lou will first refer to that race and mention the records.

Again, in reflection, it would seem that the authority to whom Sayres turned seriously underestimated his man when he presented Fageol as a conservative driver. But it was an easy mistake because the man exudes conservatism on shore.

Lou is mild of manner and bearing. He usually wears glasses and in appearance might resemble a junior high school science teacher who no doubt sings in a smalltown church choir. Behind the wheels of the *Slo-Mo-Shun*, with 1700 or 2600 horsepower at his command plus a wicked rooster-tail wake behind, Fageol was quite another man.

A fellow who saw all the Sayres-dominated Gold Cup action in the golden years, 1950-54, has described Fageol in this way: "Leadfoot Louie we called him. He was cold as ice and always knew what he was doing or about to do. Around the pits it was a by-word, 'Don't cross Fageol.' To the end of our days I don't think any of us will forget Lou going way down under the bridge at Seattle and then winding up on the way back, headed dead for the starting line. Heaven help anyone who got in his way."

Those famous starts are a vital part of the Fageol Gold Cup history which in capsule form went this way:

1951, the first Gold Cup at Seattle. Jones and Fageol were the Sayres drivers, the former in *Slo-Mo IV*, Lou in *V*, a boat completed only a few weeks before, after secret, guarded construction, and equipped with a higher-powered Rolls Royce aircraft engine. The others were using the by then conventional Allisons.

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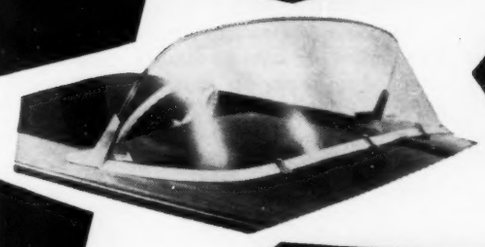

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Just before the start both Sayres boats disappeared under the distant bridge, wheeled about and laid a straight-on course for the starting line. Fageol crossed 1.5 seconds after the gun, and from then on it was no contest. *Slo-Mo V* won two straight heats; Fageol lapped everyone and established new heat and lap records. One lap was run in the then unheard of speed of 108 miles per hour.

The third heat was never finished because a Portland, Ore., boat, *Quicksilver*, ran out of control, cracked up horribly and killed her occupants, owner-driver Orth Mathiot and mechanic Tom Whittaker. The first two heats stood for the record, and this decision made small difference because no one was going to take Fageol that day.

1952. When Stan Sayres first won the Gold Cup in 1950, Mrs. Horace Dodge Sr. handed him the mug and said, "We're merely lending you this, young man." By '52 it had become a permanent loan, although Fageol was not a factor this time in Sayres' successful defense. Jones had left the Sayres team, and the *Slo-Mo* drivers were to be Fageol in *V*, Stanley Dollar Jr. in *IV*.

Slo-Mo V cracked its block while chasing Miss Pepsi in the first heat and was through. A circulatory failure in the cooling system was the fault, although one reporter suggested, "It is possible that Fageol's demoniac driving kept the water scoops in the air more than in the water."

Slo-Mo IV won in a race that saw no boat start and finish all three heats.

It was about this time that Fageol stood up at a Gold Cup contest board meeting and urged restrictions on the unlimited engine rule. He said, "I think the *Slo-Mo's* are going too fast with one engine. Suppose somebody builds a boat with two, four or 10 engines?" This was a paradox indeed.

1953, Seattle again with Fageol, now the senior driver of the Sayres stable, in *Slo-Mo V*, Joe Taggart in *IV*. Four days before the race *V* was on a high-speed test run, Fageol driving, and threw a propeller blade, a disaster that just missed seriously injuring the driver while crippling the boat. This was an ominous hint of events to come.

Slo-Mo IV won again and handily, Taggart driving two laps and Fageol the middle one. More records were set. The racing start from under the bridge was repeated, and imitators joined in.

1954. Although he may disagree, an analysis would indicate that this was the year of Lou Fageol's finest hours. Seattle was the scene once more with crowds estimated from 200,000 to 350,000 on hand. Lou had *Slo-Mo V*, and how she did go: 111.632 miles per hour to qualify. She won all three heats and racked up a perfect score of 2000 points. Taggart in *IV* helped by bird dogging the opposition.

Although no one suspected it at the time, the occasion was high-tide for Sayres, the *Slo-Mo's*, Seattle and Fageol.

1955. Events began in a repetitious manner with Seattle as Gold Cup crazy as ever. The Detroit contingent, however, had closed in upon the high standards of speed and organization established by Sayres half a decade before.

It happened that Joe and Lee Schoenith's *Gale V* from Detroit won the cup, and Fageol was not present to see the deed done.

Lou was at the wheel of *Slo-Mo V* again and, in a late afternoon qualifying run, the luck or God-given protection that all race driver's acknowledge ran out at last. Fageol was running at about 140 mph into a light northerly breeze which chopped up Lake Washington. The craft's sponsons began to lift slightly, as observers recall, and *Slo-Mo* went into the fatal rocking-chair action. Soon the right sponson lifted far above its mate throwing the boat into a steep list to port and the wind's influence crept under the multi-stepped hull. She was "kiting", as the trade knows it, or literally flying.

In a flash the hull lifted directly skyward clear of the water and it was time for Lou Fageol, 49-years-old, to leave her.

Fageol was already banged up from rough test rides, and the story goes that Twin Coach directors had urged their president to skip the Gold Cup that year. They nearly lost him for good.

Fageol kicked out of his seat, *Slo-Mo's* transom kissed the water, bow skyward, and continued her perfect inside loop. She returned to the surface intact and resumed her course for a brief distance.

Fageol's course was direct to the hospital.

Just prior to this Gold Cup referee Mel Crook had put his firm foot down about those wild, woolly under-the-bridge starts which Fageol may or may not have invented. Crook, in his province, banned them for the interests of safety. Pressure was applied to have the ban lifted, and the referee resigned because, he later wrote, he was told two things might happen: (1) Fageol might ignore the ban, or (2) the Sayres boats would be withdrawn, a move, Crook surmised, that could cause the use of small arms fire in passionate Seattle.

When the race was run, no one went under the bridge for a start.

In 1956 the scene was Detroit, and Sayres by then had sold *Slo-Mo V* to a Seattle syndicate. He still had "the old lady", as everyone knew *Slo-Mo IV*, but not for long. On a qualifying run the *IV* capsized and was virtually destroyed, seriously injuring her driver, Taggart.

Sayres died suddenly of a heart attack within a month of the Gold Cup. *Slo-Mo-Shun IV*, a battered hulk, is one of his estate's lesser assets in Seattle. Fageol is an executive; *Slo-Mo V* is in other hands. An era, and what an era, had ended. Racing had never known the equal of the Sayres team, and, although he left his desk for Seattle but once a year, appearing a few weeks before race day, Fageol was a major contributor.

While Sayres was the easy-going organizer, he knew it took courageous drivers to make the most of the *Slo-Mo's*. The record shows he had a real tiger in Fageol, never the mild mannered science teacher.

Incidents: Gold Cup, 1951, third heat, Fageol "outmaneuvered and almost ran over" Wild Bill Cantrell in Hornet at the starting, quoting from a magazine report.

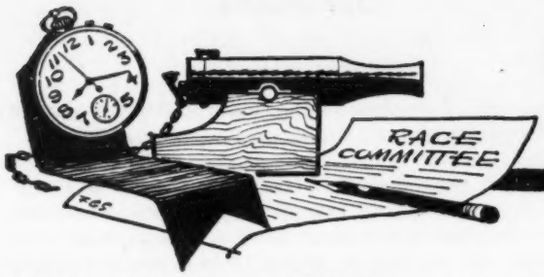
Gold Cup, 1952, Chuck Thompson driving Miss Pepsi "anticipated another wide turn by Fageol but instead caught *Slo-Mo's* tremendous rooster tail as Lou put her in tight to the buoys. The force of the rooster tail bashed in part of Pepsi's cowling." From an on the scene report.

We do not mean to imply that Fageol was illegal or even less than a sportsman. Of the latter quality he has always had it in quantity. Ask Joe Van Blerck. At the Red Bank, N. J., Sweepstakes one year Van Blerck tore up a gear box and needed a new one in the worst way for his *Aljo*. So Fageol wired his company, had a gear box flown to New York where Lou's personal plane picked it up and delivered it to Van Blerck, a competitor, at Red Bank. But in a tough, competitive field, Fageol in his late forties was equally tough, competitive and confident. An admitted critic recently said, "He was almost as good as he thought he was, which is very good."

Today Lou has a deep pride in the golden Gold Cup days and frank emotion for the boat world. As a self educated industrial designer, he developed busses, trucks, bus engines. "That was work; this is fun," he told an interviewer at this year's New York motor boat show. "This is fun" was stated with a wave of the hand at the handsome Fageol exhibit of marine engines.

There was an interruption of the interviewer as a stranger entered the booth. "Say Lou, you probably don't remember me. I raced against you at Red Bank in 1940." We suspect Fageol did not remember but his greeting was warm with a smile, a handshake and a good, long 10 minutes of old race boat talk. "How do you like my motors?" Fageol asked, with his hands upon a V-I-P. The stranger replied, "If they're yours, Lou, they must be okay," and the company president had once again crossed from his past into his future.

—BILL WALLACE



BULKHEAD BULLETINS

BOAT SHOW CALENDAR

April 2-7, 1957—Virginia Sportsmen's & Motor Boat Show, Arena, Richmond, Va.

April 4-14, 1957—Los Angeles Boat Show, Pan-Pacific Auditorium, Los Angeles, Calif.

April 5-14, 1957—Northwest Sports Travel & Boat Show, Municipal Auditorium, Minneapolis, Minn.—Exhibit Information: F. W. Kahler, Suite 409, Times Bldg., Minneapolis, Minn.

April 6-14, 1957—Houston Boat, Sports & Travel Show, Sam Houston Coliseum, Houston, Tex.—Exhibit Information: Martin P. Kelly, United Sports & Vacation Shows, First National Bank Bldg., St. Paul 1, Minn.

Apr. 8-14, 1957—Third Annual Tennessee Valley Sport Show, Knoxville, Tenn. Exhibit Information: Tennessee Valley Outdoor Show, 707 Market St., Knoxville, Tenn.

Apr. 15-20, 1957—Second Annual Boat and Sport Show, The Armory, Daytona Beach, Fla. Exhibit Information: Daytona Beach Outboard Club, P.O. Box 6024, Sta. A, Daytona Beach, Fla.

Apr. 20-25, 1957—Iowa Sports & Vacation Show, Memorial Auditorium, Des Moines, Iowa.—Exhibit Information: Martin P. Kelly, United Sports & Vacation Shows, First National Bank Bldg., St. Paul, Minn.

CLUB CRUISES

May 5—Shakedown Cruise of the Cincinnati Out Board Runabout Assn., Inc., from Cobraland to Shilo.

May 30—Thirty-three miles cruise of Cincinnati Out Board Runabout Assn., Inc. from Cobraland to Dam 37.

A.P.B.A. REGATTA DATES

Region 5

Apr. 28—Miami, Fla. .....SO
Apr. 28—St. Petersburg, Fla. 1-0

Region 9

Apr. 28—Oil City, La.....1-0

Region 12

Apr. 7—Parker, Ariz. .....SO
Apr. 14—Bakersfield, Calif. 1
Apr. 14—Phoenix, Ariz. 0
Apr. 14—Salton Sea, Calif.....SO
Apr. 21—San Dimas, Calif.....SO
Apr. 28—San Diego, Calif.....0

MISCELLANEOUS EVENTS

May 3-5—Spring conference, in Puerto Rico, of the 77th Coast Guard District.

June 30-July 7—National Safe Boating Week, sponsored by the U. S. Coast Guard Auxiliary.

STOCK OUTBOARD MARATHONS

June 5—Hartford, Conn.
June 12—Philadelphia, Pa.
June 12—Alexandria Bay, N. Y.
June 26—Milwaukee, Wisc. (Winnebagoland)

PREDICTED LOG RACES

June 25—Huckins Memorial Race

YACHTING EVENTS

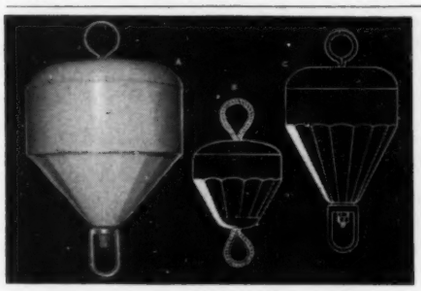
Southern Ocean Racing

Apr. 19—Tampa Around Egmont Key.

N.Y.Y.C. CRUISE

Aug. 1—Annual cruise; rendezvous at Greenwich, Conn. Other dates:

Aug. 2—Duck Island
Aug. 3—Mystic, Conn.
Aug. 4—Lay Day, Mystic, Conn.
Aug. 5—Shelter Island
Aug. 6—Regatta, Gardiners Bay
Aug. 7—Block Island
Aug. 8—Lay Day, Block Island



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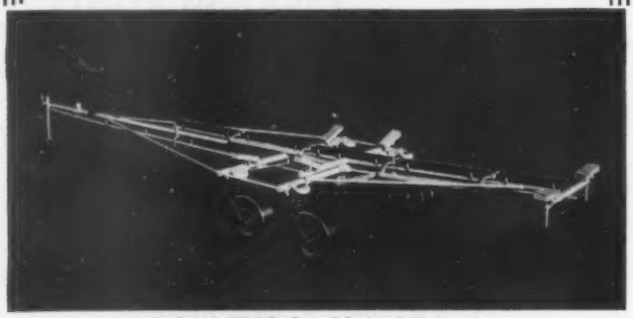

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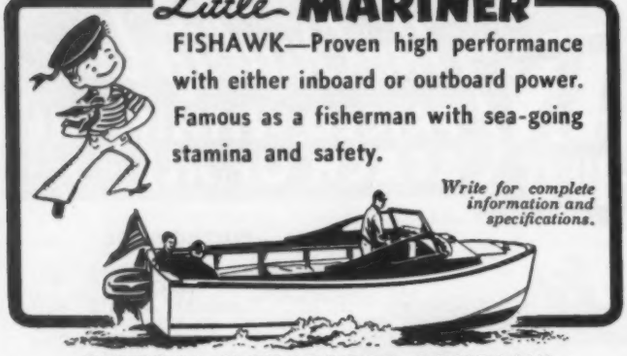

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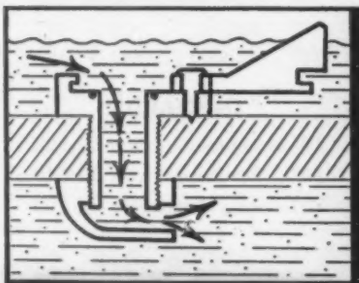

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OFFSHORE

(*continued from page* 31)

"Hey, Al!" I reached in the bunk, grabbed a shoulder and started shaking.

"Wh . . . what?"

"Let's go, boy—got a bad leak and need you to pump."

Fortyish, retired and inexperienced at sea, he'd signed on to help deliver a new ocean-racer to New York expecting a joyride. At my call, he leaped up in alarm and cracked his head on something over his bunk. "Leak . . ?"

"Still got that flashlight?"

"Yeah, sure," he fumbled around, "right here."

"You'll need it. Batteries are shorted out—there's no light, no ship-to-shore radio, no nothing."

"I'm coming!"

Passing my bunk again, I kicked into pants and shoes, punched my way into a shirt without bothering to button it and slammed back into the unoccupied owner's cabin where we were carrying spare sails. Al bounced and stumbled his way through the darkened main cabin behind me.

"What d'you think it is, Van?"

"Dunno, Al, we shoved some ballast up forward under the mast in Miami—she's probably strained a plank or something. Here," I kicked the small working jib bag out at him, "take this on deck and tell Pete we're going to shorten sail and ease the mast load as soon as I get up. . ."

"O.K.," he yanked back the companion slide.

"You take the pump and keep John on the wheel—we'll find where all this damn water's coming from after we change sail."

He nodded, shoved the jib bag up the companion ladder and started to follow it only to get slashed across the shoulders by a sheet of spray. "What is it," he sputtered, starting up again, "a storm?"

Someone in the cockpit snarled back in the wind.

Grabbing my flashlight and chart off the ice chest, I made a quick mental advance from our evening position. We were about 50 miles out in the Atlantic, paralleling the Georgia coast on a northerly course for Charleston. If we couldn't keep ahead of the leak, there was a chance we could beach the boat.

Broad-reaching straight for shore in a breeze like this, *Katuna* might hold seven knots even in a half-sunk condition. That meant we wouldn't go smashing in on the shoals until some time after dawn. If there was anything left after that, we'd have all the daylight we needed to try and launch the dinghy and get in through the surf.

Of course, if the mast came out of her or we smashed the dinghy or someone got swept off . . . I tossed the chart down.

Somebody was as good as drowned if we didn't find that leak.

"Pete . . !" like Al, I hit the deck in a sheet of spray. "Let's *go* on that jib!"

Since sunset, it had turned to winter and the nor'easter was howling in, heavy, cold and full of weight. *Katuna* was staggering through it, more under the seas than on top, and laying down on her ear like a centerboarder that's on the edge of going over. Solid water was rolling up the side of the cabin trunk and swamping the cockpit in puffs, and even crawling forward along the weather side, you could feel the gusts picking up all the time.

Pete and I crossed the foredeck crouching, smashing down on all fours when *Katuna* hit a trough, transferring our grips when the water rolled off and nudging the sailbag as we could.

"I'll take the pulpit . . !"

"Take shackle's open," he shoved the foot of the sail at me and we began hanking it on.

It was an inch-by-inch job and cold, but when we got to the top snaps it went easier. Still, we were a quarter of an hour making the complete change and getting back into the cockpit.

"How's she sailing now, John?"

"Better—not getting knocked down so much . . . "

"Sail her high, boy. If you let her take a hard knockdown with all this water in her, she may not come back."

"Somebody want to spell me a minute?" Al said weakly.

We all took 100 strokes on the pump. I was desperately anxious to get below and hunt down the leak, but until we knew how well we were holding down the water, I wouldn't be able to decide the last possible minute we could head for the beach and still hope to make it.

We counted aloud, and when it came my turn all I could concentrate on was getting to 100 and starting to hunt the leak. Al hadn't done enough sailing to take the helm, but Pete and 19-year-old John managed to keep *Katuna* from getting overpowered too often. Once or twice in gusts, she careened down and bit off a chunk of solid water that poured into the cockpit and around my knees as I pumped but it couldn't be helped.

"One hundred . . . !" I straightened up. "You take her awhile. Al—Pete, let's grab a look around."

Before I hit the bottom of the companion ladder, I knew time was shorter than we'd even guessed. By the light of the flash I could see water running *out* of the lee side lockers and collecting on the cabin sole. It was getting so high the bilge wouldn't hold it now, and there were several buckets already washing back and forth from one side of the main cabin to the other.

"You gonna try and beach her?" Pete asked.

"We're not holding our own by a long shot," I looked at the water in the cabin.

Seven hours to the beach—with pump and buckets together, could we make it?

"Under the mast," I said, "let's take a quick look."

The air in the blackened cabin felt as wet as on deck, and the swirling bilge drowned out everything except the *thoomp* when her bow dropped off into a trough. Poking forward, Pete and I opened the bilge by the mast and started taking out iron pigs and piling them along the sole. When there was a space big enough to run my hand in, I felt along the planks.

"Helluva leak wherever it is," I muttered. "You'd be able to feel it . . . "

"Nothing?" Pete said.

I looked aft in the flooded cabin, and the equation in my mind shortened again—seven hours to the beach divided by the capacity of the hand pump and buckets—maybe it was too late even now.

"Not here. Let's start forward and work aft."

I was face down, reaching through another bilge access in the forward cabin when Al yelled.

"See what he wants . . . "

" 'Says the pump won't work.' "

"The strainer," I jumped up. " 'In the owner's stateroom—strainer's clogged up. Got to be.' "

Stumbling aft then, Pete and I hurled sail bags right and left and tore up the bilge there. Reaching down elbow deep, I pulled away a handful of wood chips and trash

"Try it now . . .!"

There was a pause. "O.K.," Al called down the hatch. "she's working again."

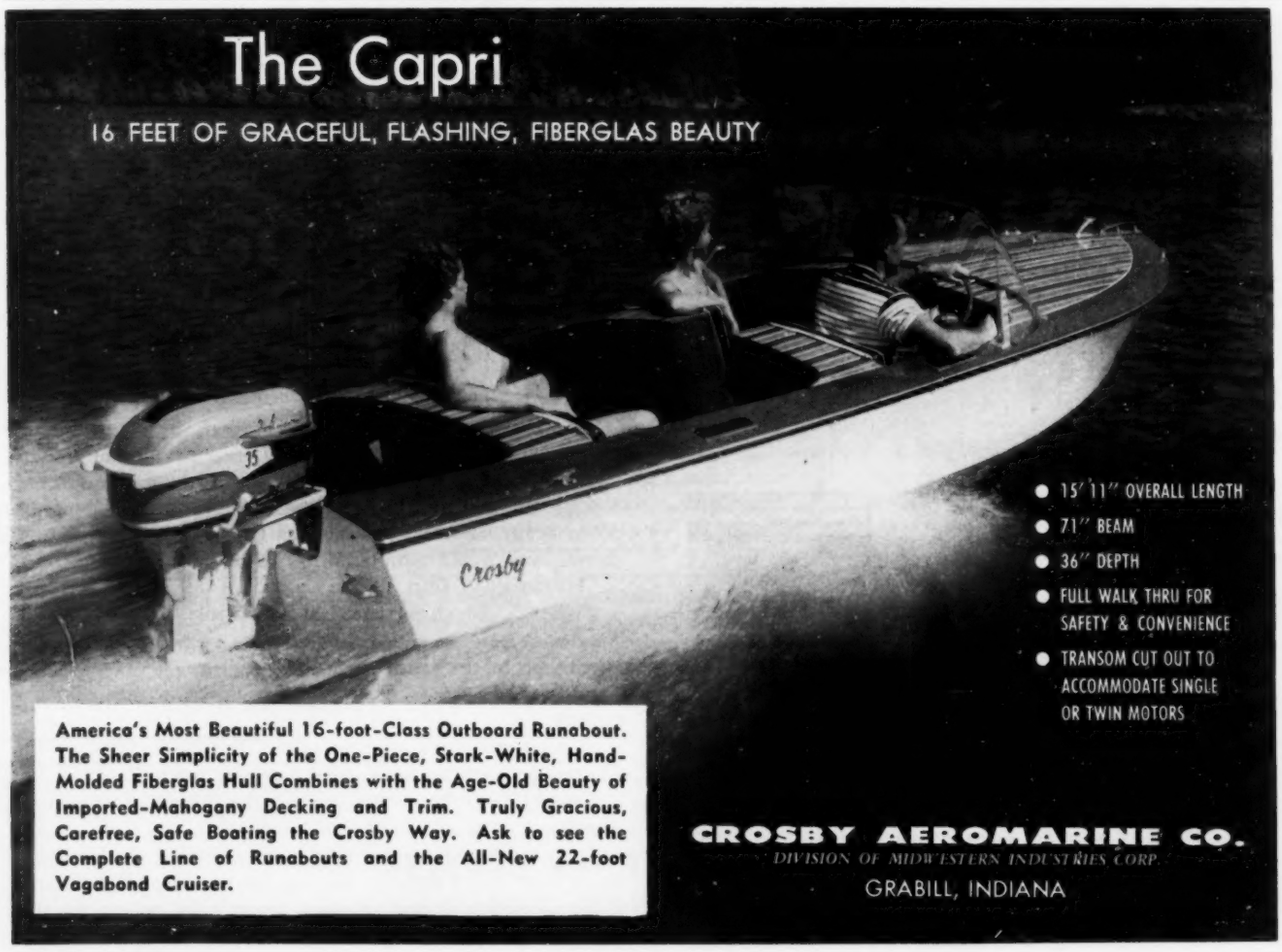
"Damn a new boat—it's the first time she's ever had bilge up behind the ceiling," I swore. "We gotta keep a man here to clear the carpenter's chips away from the strainer—bilge is full of them."

"If this pump stops, that's it," Pete agreed. "We'll rotate."

"O.K., here, take the flash, I'll get another one."

Time was running out now. As I went forward, the water in the main cabin was rolling over my shoes, and no telling when the hand pump might stop.

Quick now and careful . . . no water coming in through the deck . . . none running down the planking from the eyes . . . none running down the bilge from the chain locker . . . forward toilet normal with seacock off . . .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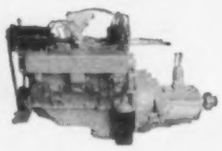

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galley seacocks all off except the useless electric bilge pump (and it had an automatic check-valve in the line) . . . owner's toilet normal and off . . . all the easy possibilities were ticking off one-by-one.

The engineroom was our last chance, and as I dropped down through the bridge-deck hatch, I could see that was out. Exhaust and engine cooling intake were shut off, and no water was running down from aft. That did it—she must be leaking down somewhere deep under the batteries or tanks, we'd probably never know.

"Find anything?" John was pumping when I climbed back on deck and dropped the hatch.

A cloud of spray rose up and sizzled back over the cockpit.

"Nope," I wiped my eyes and relieved him on the pump.

"Want me to head for the beach?" Pete was at the wheel.

I didn't answer, but I did think about the beach. I could see us grinding up on the bar, turning broadside to the weather and being laid flat. I saw us trying to launch the dinghy down vertical decks only to have it turn over, saw someone slipping away from the boat and disappearing in the surf . . .

I looked into the weather. How big would the sea be by dawn? How much chance would we have?

"Van?"

"I *heard* you!"

And the leak down deep too, but how? I'd seen that bottom planked when *Katura* was built, seen it a month ago in Miami—nothing wrong there. I remembered watching the boat being fitted out and my mind raced over the bilges . . . tanks, drain plug, batteries, that damn electric bilge pump . . .

Bilge pump!

What could be deeper in the bilges than the electric pump pick-up? I visualized it in the bilges with wood chips swirling around . . .

"Wood chips!"

"What?" John said.

"Here, take it for a minute . . ."

"What's wrong," Pete said anxiously, "pump clog up again?"

"Just thought of something," I climbed out of the cockpit, thudded down the companion ladder and *splashed* into the cabin.

We didn't *know* the check valve in the electric pump line was working because there'd been no electricity to even try the pump. The only open seacock in the boat was on that line.

I wasn't hoping too hard when I ripped up the bilge access next to the galley because it was a good valve and shouldn't fail. Still, those wood chips . . .

My arm went into cold, black water nearly up to the shoulder as I felt the pump unit and ran my fingers down to the intake. I felt the coupling, the strainer and then water trying to push my hand *away* from the intake screen!

Now the seacock. I straightened up, cut it off and felt down again. There was nothing. Reverse the process and there it was, water coming *in* through the electric pump line.

"Found it!" I shut off the seacock a last time.

"What?" Al straightened up painfully in the owner's stateroom holding another handful of wood shavings he'd cleared from the hand pump.

"What?" John's face hung upside down in the companionway.

"Found the leak—we're O.K.," I yelled. "Dinner in Charleston tonight, boys, steaks on the house!"

I could hear Pete whoop over the sound of the nor'easter.

Later, while we were taking turns pumping the boat dry again, Pete and I figured: the last time we used the electric pump in Miami some shavings must have gotten by the pump strainer and lodged in the check valve.

When the nor'easter hit a few hours ago, *Katuna* heeled over so far that water rose up over the gooseneck, rushed down past the open valve, through the pump and into the bilge, setting up a siphon action. That's why she kept on leaking even after we shortened sail and started sailing on our feet again.

"All the time we were pumping with the hand-pump, it was running in through the electric pump—only faster," Pete said.

"Wait'll I get this hooker on the ways," I growled between strokes on the hand-pump. "I'm going to put in a second heavy-duty manual pump and take that damn check valve business right on out. When you don't have so much automatic junk on a boat, you don't trust it to work and then get caught when it doesn't."

"We should've shut *all* the seacocks anyhow," Pete said. "I was just so sure it was under the mast, though . . ."

"Your turn at the pump."

Charleston jetties showed up dead ahead just before noon, and at 12:30, John put the wheel down as *Katuna* went smoking into the harbor reeling off 10 and 11 knots with slacked sheets and the sea behind her.

I had a momentary vision of crunching in on the beach at that speed, and then we flashed by the pilot boat anchored just inside the jetties. Having seen an unannounced yawl punching up from the southard in a cloud of spray, the pilots were perched all over their boat yelling as *Katuna* snored by pulling a wake that threatened to roll into their cockpit. That afternoon, one of the pilots came ashore just to see who the Hell we were.

"Wind been blowin' on fohty-fifty knots in gusts all night," he drawled. "You boys must've had a real sail."

"Yeah, it was very interesting," I said, spreading out another shirt to dry on the rail. "A little wet though."

—LEONARD VANDALEN

FISHING FOR ALL

(*continued from page* 10)

out of sight around the bend in either direction and fast water would drown out anything less than a cannonade, and perhaps even that. Presently a long-legged native came upstream fishing minnows, pulled me out of the bog and showed three nice trout in his creel.

I went on downstream in the drizzle of sleet, and came out of the trance as I piled headlong into a deep fast run, cold enough to make a fur-clad Eskimo scream for mercy. I was wet to my ears and my plastic, waist-high waders were filled with several gallons of ice-water.

I pulled off the waders, emptied them, got back into them soaking wet and soon came upon a companion, who appeared at first to be frozen stiff where he stood. Presently he moved and I was recounting my experiences when a stranger who obviously was a veteran angler came along and said:

"No use fishing; too much snow water in the stream. Fish won't hit. It's also too cold, too roily, and too early in the year and the water's too high and too much food has been washed into the streams.

He turned right oblique through the woods, never to be seen again.

I fished on down the stream without seeing another single fisherman up to the time I sat down under a dripping bush to eat a sandwich, and drink some cold coffee. The stopper had not been placed securely in the small thermos bottle. I went on fishing through the day into dark, meeting I think only two more anglers all afternoon. I thought I had a hit once, but it probably was the wet fly nicking a stone. No one else in our group even got a strike they disclosed that evening back at the lodge.

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Inaugurating a sleek and spacious utility camper. Gives amazing performance with single or twin engines. She's everybody's candidate for aquatic action — no cavitation on fastest, hardest turns. Glossy three-tone and mahogany finish with chrome hardware.

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STANDARD EQUIPMENT: Bow & stern cleats, bow chocks, ¾" metal stem band, forward split seats, life preserver racks, full length metal on gunwale and splash rail ☒

Double Knees. Bow lights, stern flagpole staff light, convertible top, mahogany frame windshield-safety glass throughout, chromium trimmed white rubber footpads. ☒

SPECIFICATIONS: Weight, 650 lbs.; length at gunwale, 18'; width at top of gunwale, 7'. ☒

OPTIONAL EQUIPMENT: Forward Hatch (18"x18") • Steering Wheel (installed with control panel, pulley blocks, cable guide, etc.) • Mahogany Rear or Center Seat ☒

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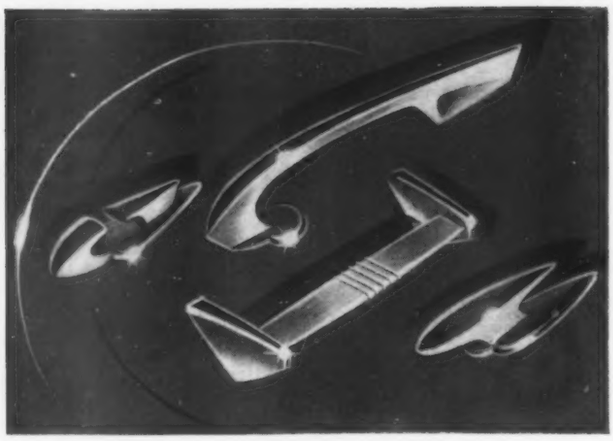

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Wilcox-Crittenden leads again in styling, construction and durability of deck fittings. The multiple facets and triple chrome finish of the new Sea Flair fittings give them a flash that says "smart." Functionally right, too, "Zamak" metal die castings give extra strength. All bases are flat. Handles are stud mounted for ease of mounting and greater strength.

These new fittings are included in the 64-page 1957 W-C small boat fittings catalog. Send 25c for a copy of this remarkable book.

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2" x 13"*	$1.95	4" x 18"	$7.45
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*Grommeted - one end only

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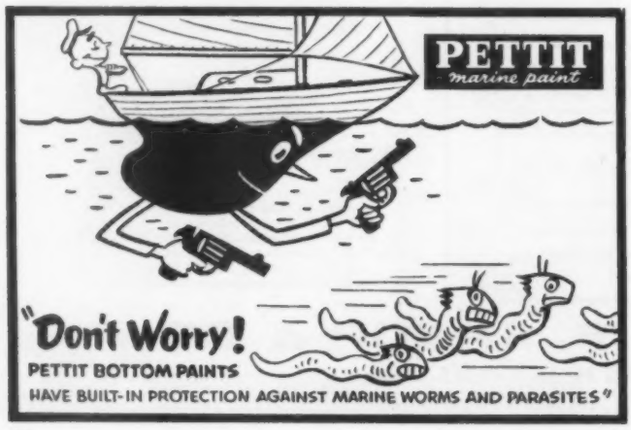

That opening day last season finally convinced me. No more of that getting up at 5 o'clock in the morning on opening day for me, just to be among the first on the stream. I don't care what the other devoted opening day fishermen do. I'm not going to get up until 5:30 and if the weather is real bad, I may not get up until six for this mid-April opening day.

This is for sure: Somebody already will be on the stream opening day no matter what time you get up, what the weather is like, or whether you are fishing in the East, the South, the Midwest or Far West. Opening day has a fascination that is irresistible for some anglers, whether they are trout fishermen, bass fishermen or pursuers of some other breed.

The luckiest guy of all is the black-bass fisherman in states where they have no closed season. Next to him is the black bass fisherman in states where they have a closed season with the opening in the good old summertime. They may not catch any fish either, but they at least do it pleasantly, generally from a boat and without freezing. The salt water angler in warm climes has no problem at all, fishing the year round—except for occasional hurricanes and such. He's always ready. The trout fisherman has the added pleasure of getting his gear together for the opening after the long layoff.

Assuming that some weeks before the opening you have unwound from reels your fly lines and let them hang in loose coils to get out tight turns set in by the winter's rest, and that you have oiled reels and checked tackle, don't forget to bring these items:

A fishing rod, a fishing reel, a fishing line, a half dozen or so leaders, an assortment of wet and dry flies, and chest-high or waist-high waders or hip boots, suspenders to hold them up, some of which items—including a rod—have been left home in the excitement of opening day; a change of clothing, which should be warm and include underwear, socks, pants, shirts, hat or cap, fishing vest or coat, parka, and handkerchiefs; toilet articles, and such fishing equipment as a fishing license, polaroid sun glasses, a knife, a small flashlight, a cigarette lighter, matches, split shot, a clipper for cutting leader ends, a thermos bottle for coffee, a corkscrew for snakebite remedy.

You will need later on in the season and may as well get used to carrying them now, such items as fly dressing, line dressing, insect repellent, and perhaps a leader sink concoction if you prefer the commercial stuff to mud, soap, or fish slime. Some also use toothpaste.

You may also want a wading staff, a landing net, and a creel. I don't carry these items. A wading staff will eliminate some falls in the stream, but it is a nuisance and I probably would fall in anyhow; a landing net gets hung up in the brush when you are out of the stream and always is in the way. A creel is something to carry fish in when you catch any, and thus positively would be the least useful of items for me. I don't catch that many and I throw back in what I do catch.

All the foregoing covers average early-season trout-fishing in most places. I probably have forgotten some items, but bear in mind a fishing vest contains at least a big zipper pouch, three big zipper pockets, four to a half dozen lesser pockets, wool patches on which to hang flies, and some vests even have pockets on the sleeves. But there still aren't enough pockets. Some anglers need room for such things as a thermometer to take temperature of the water, a book on etomology to check on fly hatches, a little metal club with which to hit on the head any trout that the angler may wish to keep, and which shouldn't be subjected to the indignity of being hit with a rock.

Some also carry at all times an extra reel and line for the switch from wet to dry fly fishing and others, having filled all pouches and pockets, hang stuff from their hats and still always wind up in need of something that was forgotten. But don't forget that first day of the season—it's an experience only a fisherman could endure. —LAWTON CARVER

FITTING OUT

(*continued from page* 23)

Paint this spring will not be only for appearance. A plastic or aluminum runabout with a slippery deck can be cured with a new neoprene paint coat, or one of the specially compounded "non-skid" deck paints. Less sophisticated old timers may continue to scatter a handful of sand over the freshly painted floorboards to give firmer footing. Don't use too much on surfaces where passengers sit. The sand-in-the-paint treatment has been known to wear a rapid hole in the seat of a bathing suit.

In addition to the time tested seam compounds and sealers, there are now rubber-base fluids and putties that can be fed into a seam to provide an expansible and water-tight caulking.

New this year, as well, are several bottom paints for salt water use with a claimed anti-fouling potency that can allow you to skip a season or so of repainting at fitting out time. When using these, as with any marine paint, follow the manufacturer's directions carefully when applying.

Much of the repainting being done on boats this spring could be less extensive if the boatman had followed one simple instruction carefully—*prepare the surface to be painted.* No paint can hold onto a surface that is rusty, oily, cracked, blistered, or flaking. Adding one more coat to a number of tired underlayers is asking for trouble. Fitting out for many conscientious boatmen has always meant a time of endless hours of sanding, but some of the new paint removers and power sanders will shorten that drudgery.

If all your tools are powered by elbow grease, consider renting or borrowing a power drill with screw driver and disc sander attachments should a major repair job arise. Spring does not always offer perfect outdoor working weather and a weekend with intermittent showers is easier to handle when power tools make the job go fast.

Don't fail to try out one of the Screwmate combination countersink drills if you will be putting in a number of screws; they are available in sizes to provide pre-drilled holes for most standard screws. And do not skimp by using ordinary iron screws, nails, and fittings. Streaks of rust will quickly show why galvanized, brass, bronze, and Monel are among the preferred marine metals.

Even these superior metals will not be compatible if used together, particularly near salt water. A galvanized shackle holding a bronze turnbuckle can start corroding quickly because of electrolytic action. Check your underwater fittings before launching and determine if a zinc hull block may not be needed just to corrode away and keep the danger from propeller, shaft, skeg, rudder, and more valuable items.

If you plan any night cruises this season, you probably have wiring for your running lights that deserves its spring check-up. The low voltage of most boat systems requires sufficiently heavy gauge wire to prevent line loss. Check to see if corrosion has started on exposed joints that can be cleaned off and protected with one of the new plastic insulating sprays. And see if you might install some of the new fluorescent tubes for cabin light. Small versions of the home models, they will use less of your precious current in return for light delivered.

Powerplants, inboard or outboard, deserve special checking over. Neither are designed to run in just the manner you are used to with your car; both will leave you in much more serious trouble if they quit or fail to start. The inboard must have, as a minimum, a testing of ignition and cooling systems, check for water jacket or fuel leaks, examination of all safety devices, spark plugs, control linkage.

Examine, and preferably change, your outboard's spark plugs; lubricate lower unit and controls; be sure the cooling passages are unclogged and flush if necessary.

And as a final but important step, be sure your fire extinguisher system is working, your insurance is in force, and your trailer or launching schedule is ready. Then you should be fit for a head start on a fine new season.

—CONRAD WILLIAMS

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Unusually safe, the CADET has been especially designed so that, in the event of a capsize, it can be righted and sailed on without taking water aboard. Four buoyancy bags insure that the boat will support herself and crew should she become waterlogged.

The CADET can be launched easily off an open beach, is built of prime materials with expert workmanship and has all the qualities of a thoroughbred racing dinghy.

Dimensions: Length, overall, 10 ft. 6¾ in.
Beam, 4 ft. 1⅜ in.

Sail area: Mainsail, 42 sq. ft.
Foresail, 13½ sq. ft.

Weight: Bare Hull, 120 lbs.
All up, 150 lbs. approx.

Draft: 6½ in. and 2 ft. 6 in.

Height of Mast above Deck: 16 ft.

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Main & Jib Sail with Sail Bag & Batten..... 55.00
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SPECIFICATIONS

Length	95"
Width	44"
Depth	16"
Weight	85 lbs.
Frames	2
Seats	1
Outer Keel	1

Planking, full length ¼" three ply Floor Boards—Built-in
Forward Deck .... 32½"
Outboard Motor ..... up to 7½ H.P.

Motor Board	1
Bottom Battens	6

KIT

Assembly unpainted	$ 95
Assembly painted	160
Equipped	220

ROBERTS KIT CRAFT POST ROAD BRANFORD, CONN.

PROPELLER PRINCIPLES

(*continued from page* 33)

m.p.h., which is 1408′ per minute. However, our propeller theoretically was advancing us at 21¼ m.p.h. at a computed 1875′ per minute. By subtracting the boat travel in feet from the propeller travel in feet we find there was 467′ of slippage per minute. Dividing the boat travel per minute into slippage per minute, we find that the propeller we used operated with 33% slippage or was only about 67% efficient.

Now comes the big question. Was this the proper propeller or could more efficiency be gained with a different propeller? It certainly is reasonable to expect that if at the same r.p.m. we could find a propeller that is 80% efficient, rather than 67% efficient, the 13% increase would be represented in greater speed or increased operational economy at the same speed.

Once it has been determined that a propeller is inefficient, how does one go about choosing a more efficient propeller? Let's first consider a few generalities. To the owner of a motor sailer, efficiency of the propeller may be of little importance since the powerplant will be expected to be used only on rare occasions and neither speed nor economy of operation is of any real importance considering its minimum planned use. However, in the case of the sailing hull with the auxiliary motor, another consideration should be faced. The owner of the sailboat is interested in efficiency under sail if not under motor power. Propellers are made in innumerable pitches, diameters and numbers of blades ranging from two to six or more. The sailing operator should recognize that if at all possible his boat should be equipped with a two-bladed propeller to reduce to a minimum underwater drag under sail.

For the inboard or outboard owner, however, the problem is not nearly so simple. First he must realize that for power boats no all-purpose propeller exists. A propeller which offers maximum acceleration will not necessarily offer maximum top speed. A propeller that offers excellent lugging power may prove weak in acceleration and top speed. Or the wheel that offers tremendous maximum speed under light loads may be a poor high speed performer under heavy loads.

Several years ago the essentiality of proper propeller design was dramatically demonstrated to me by the problems encountered by a friend who owned a 28′6″ long Hickman-designed, 7′6″ beam, sea sled express cruiser. This boat was equipped with a pair of Chrysler Crowns rated at 115 horsepower each at 3200 r.p.m. With a 2:1 reduction gear box and swinging 28″x28″ propellers, the sea sled, owned by Sidney H. Kane, M.D., of Philadelphia, was able to romp along at an amazing 40 m.p.h. The propellers were of a surfacing type. That is, at high speed the upper sector of the arcing blades rotated free of the water. For nearly a year, Kane had no trouble maintaining peak speed with his custom designed hull. The nearly nine ton rig named Little Squirt II could sprint past practically anything on the local waterways. Then one day Squirt, while cruising at about 30 m.p.h., barrelled into an airplane, a derelict that had crashed on the river, sunk and later apparently drifted off the river bottom and floated just beneath the water's surface into the main ships channel.

Though it was somewhat of a claim to fame for a boat to collide with an airplane, it wasn't without certain disconcerting factors. Squirt's rudder was carried completely away, the props were badly banged and her under skin was torn. The damage, seemingly superficial, was covered by insurance. Within several weeks she had been repaired, new 28″x28″ wheels had been put on her and she was ready for her trial runs. Slowly, as the boat's owner advanced her throttles, the tach reading began to climb until eventually it reached well over the rated safe maximum

r.p.m. But Little Squirt slogged along at 6 or 7 m.p.h. and no amount of coaxing or scolding would get her up on plane. The repaired bottom surfacing conformed perfectly to the original design specs. For more than a year, the frustrated doctor tried one new wheel after another, and consulted with numerous propeller specialists but none of the replacement props quite did the trick. And neither the doctor nor the specialists were able to diagnose his boat's propeller ailment. The custom builder had discontinued his business and couldn't be contacted. Kane tried formula after formula: 28″x28″s, 28″x26½″s, 27″x29″s, 27½″x 29½″s and dozens of others. Then he tried variations of all the true pitch wheels with lesser pitch on the leading edge of the blades and progressively steeper pitch ranging out to the following edge. A half inch change on the leading edge of one set of wheels finally boosted Squirt's speed up to 14 m.p.h., still 26 miles below her peak, but it was the first prop formula to top 12 m.p.h. The Crowns' r.p.m. reached a peak of 2700, 500 short of their rated r.p.m. Other combinations were tried including, oddly enough, 28″ diameter wheels with 25½″ blade leading edges and 28″ following edges. The motors' maximum r.p.m. dropped to 2450, but top speed reached 17. Still the boat was mushing when it was designed for planing.

Back in top form, Little Squirt hits 40 m.p.h.

Kane finally found a combination of a 28″ diameter wheel with a 24″ leading edge pitch and 27″ following edge pitch. The maximum speed of the Crowns dropped to 2100 r.p.m. but the boat speed reached 20. Squirt just wouldn't bounce back over the planing hump. Finally Kane, after nearly a season of increasing frustration, located the designer of the original propellers. The man immediately agreed that he had in fact used 28″x28″s of standard manufacture but he had added a little touch of his own by beating the trailing edge of the blade a bit with a hammer to give them a cupped effect.

A new set of 28″x28″s was bought and the prop expert gave the blade tips his magical rap. Then he carefully checked out each modified tip with a prop indicator, until the contours all balanced, within .010″. On the first trial Squirt responded like a jack rabbit and planed out at nearly her original 40 m.p.h. peak. Granted Dr. Kane's boat, because of its inverted-V design and surfacing type propellers was exceptionally touchy, still the importance of small variations was dramatically pointed up.

In general no owner of an average boat needs the somewhat unorthodox touch that Sid Kane's prop expert offered. Nor will it take most boat owners nearly a year and dozens of sets of propellers to find suitable screws for their boats. However, with a well designed boat with hull maintained in good condition and with a properly mated powerplant much of the ultimate performance is going to rest both with propeller selection and propeller condition.

Outboarders have at times been plagued by excessive vibrations which they know, by contrasting their own boat's operation with that of others with the same motorboat combination, is excessive. Propellers of outboard motors in particular are subject to damage in the handling at showrooms prior to sale or they may be banged by owners in transporting motors or putting them on or removing them from their boats. Motors which vibrate excessively frequently indicate out-of-line propellers. Most well-equipped outboard motor repair shops have propeller in-

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dicators, or they have sets of standard factory propeller pitch blocks. The former are more accurate for checking out-of-line propellers which even when factory-new, can be out of alignment in considerably large fractions of inches. The speedboat racer, for example, who's consistently up in the winning ranks must pay particular attention to his propellers. The difference of even minute variations from a standard propeller has in many instances developed winning combinations. Though the bulk of the boaters are not interested in high speed competition, it's the rare boat owner who does not want to get maximum efficiency out of the boat and motor combination he owns.

Through countless hours of experimentation, propeller manufacturers have been able to prepare propeller recommendation charts for nearly all standard boats, inboard engine installations or outboard motor applications. Your local dealer will have or can obtain such charts which will serve at least as a starting point for your own propeller testing.

For the outboarder in particular who is dealing with far lesser developed horsepower than the inboarder, the proper propeller is important in achieving ultimate satisfaction in boat and motor combinations. Outboarders owning mid-range and large horsepower motors, powering boats suitable for a variety of water sport activities, must understand that no single propeller will offer top performance for all types of activity. The propeller that offers highest speed will not prove the most satisfactory for towing water skiers.

Motor manufacturers make it a practice to rate the horsepower of their motors within a range of revolutions per minute. To turn out this horsepower output, the motor must be able to operate at or close to the rated r.p.m range. If, for instance, a 25 horsepower outboard motor is rated at that horsepower at 4500 r.p.m., and because of boat design or load conditions a tachometer test indicates that the engine reaches only 3800 r.p.m., peak performance is not being achieved and the motor is putting out only a fraction of its potential horsepower. With a knowledge of your motor's actual r.p.m. peak, and its rated peak, your dealer can offer you a propeller that will permit the motor to rev properly. Usually if the engine is turning below the stated operating range at full throttle. the propeller has too much pitch and a propeller of lower pitch is needed to attain a higher r.p.m. If the motor easily surpasses the rated r.p.m., again the propeller is wrong and performance is not as great as will be attained by using a propeller of greater pitch.

The propeller selected for outboards pulling water skiers should be one at which the motor will reach maximum rated r.p.m. with the average expected ski load in tow. However, the operator of a boat must understand that without the skier under tow, the motor will be able to rev up considerably higher than rated r.p.m. and under that light load condition with the water-ski-tow selected propeller, performance will not be as good as it would with a different propeller.

Obviously then, the ideal situation for the outboarder is to own several propellers, each to be applied to meet the desired operating conditions.

Since bent or nicked propellers will set up vibrations in the engine, it should be recognized that these will not only reduce propeller efficiency but will have damaging effects on the operating parts with continued use. Propellers should be checked frequently. Nicks should be repaired and badly damaged propellers should be replaced. Some propeller repair outfits merely cut away the damaged sections, clean up the blade edges and though the end result may look very handsome again, the wheel's diameter has been reduced and in actuality you are operating with a wholly different propeller, though it may again be in proper pitch and balance.

If you want to enjoy maximum efficiency, at least as far as your boat is concerned, check for showing slips and remedy the problem. —HANK W. BOWMAN

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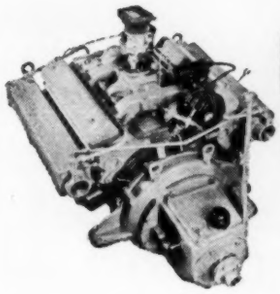

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Easily carried by car as well, not only the boat but all accessories such as oars, camp chair, and duck blind fold compactly for easy portability.

Though resembling an inverted umbrella, the Packet is reportedly stable and able to support up to 500 lbs. load.

ONE of the most novel lightweight folding boats designed for either fishermen, hunters or just plain rowing around in the home pond is the Packet, manufactured by the Porta Company, Inc. The folding water lily pad-like boat condenses into a compact 38″ high by 20″ wide, 24-pound package which, equipped with a harness, can be lugged papoose style. The overall weight includes a comfortable canvas covered aluminum folding (naturally) chair, nylon resin oar locks, and hollow aluminum tubing telescoping oars with aluminum duck feet-like webbed blades.

The frame work is comprised of umbrella rib-shaped aluminum tubes secured to a center anchoring post. The ribs are salt water resistant and have a tensile strength of 42,000 pounds per square inch. The entire boat folds or opens like a fan. The outer skin is constructed of 20 ounce mildew and rot proof forest green duck, coated with a vinyl resin that will resist cracking at temperature ranges from 20 degrees below zero to 135 degrees F.

The packet before being launched on a nationwide scale was given extensive field tests in Alaska and Canada. It has proved itself to be highly stable with loads of up to 500 pounds and has the added unique feature of drawing only 2″ of water with a 200 pound load. Ready to launch, it measures 6′ long by 4′ wide at extremes. Two accessories are available: the first is the Killick, a molded lead anchor which weighs 10 pounds, sufficient to hold the Packet in either sandy or rocky bottoms against reasonable currents, and designed to be snag proof. The Killick lists at $5.95.

The other accessory is a Packet blind priced at $54.50. Like the Papoose boat itself, the blind folds into a compact parcel in its own carrying bag, measuring 30″ long by 12″ in width and weighing less than 10 pounds. The duck blind kit includes the blind proper constructed of 10,000 pieces of marsh grass colored, non-fraying raffia fastened to a mildew and rot treated 4″ mesh seine net, which covers a folding framework, like the boat ribs, constructed of aluminum tubing.

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